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EFFECTS OF PRICE AND ACCESS LAWS ON TEENAGE SMOKING INITIATION:
A NATIONAL LONGITUDINAL ANALYSIS

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ABSTRACT

Over the past three decades a significant amount of economic research has established that increasing cigarette prices reduces cigarette smoking among both adults and adolescents. The consensus estimates for the price elasticity of adult demand from these studies fall in a narrow range of –0.3 to –0.5, suggesting that a 10% increase in the price of cigarettes would decrease adult consumption by 3%-5%. A smaller literature on youth responsiveness to cigarette prices has also emerged. A majority of these studies concluded that youth are up to three times as responsive to price as are adults. Only four econometric studies have attempted to model youth and young adult smoking initiation decisions. All four studies concluded that cigarette prices (or cigarette excise taxes) are insignificant determinants of smoking initiation.

This study addresses the limitations of the previous studies on smoking initiation and examines the impact of cigarette prices and youth access laws on adolescent smoking initiation. Nationally representative longitudinal surveys of 8th and 10th graders as part of the Monitoring the Future project are employed in the analysis. State-specific prices and several measures of youth access restrictions are added to the survey data. Discrete-time hazard methods are used to model the probability of initiation. Contradicting the results of the four previous studies on smoking initiation, the results of this study clearly indicate that increases in the price of cigarettes would significantly reduce the number of adolescents who start smoking. The results are mixed with respect to youth access restrictions.

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I. Introduction

The prevalence of cigarette smoking among American teenagers was rising for a good part of the 1990s. According to the Monitoring the Future Surveys (MTFS), the proportion of 8th and 10th graders categorized as current cigarette smokers increased dramatically between the years 1991 and 1996. Similarly, the proportion of current smokers in the 12th grade significantly increased between the years 1992 and 1997 (Johnston, O'Malley, and Bachman, 2000).

This upward trend in adolescent smoking coupled with the addictive nature of cigarettes has caused a great deal of concern among public health advocates. Since many adolescent smokers continue to use tobacco products as adults, the sharp rise in youth smoking in the 1990's is likely to translate into future increases in adult smoking. Given the incontrovertible health effects of smoking, efforts to prevent youths from starting may be the most effective means to reduce the future burden of tobacco related disease.

Understanding why many youth initiate cigarette smoking and what impact public policy plays in deterring smoking onset is of utmost importance to reduce the harm associated with smoking. This paper is the first econometric study to examine the determinants of smoking initiation among adolescents during the rapid rise in smoking in the 1990's. In particular, this study examines the impact cigarette prices (which can be manipulated by excise taxation), youth access laws, and other socio-demographic factors have on youths' decisions to start smoking.

II. Previous Research

Economic research in the last three decades has shown that cigarette prices are inversely related to cigarette demand. A National Cancer Institute sponsored gathering of

economists and other experts concluded that the overall price elasticity of adult cigarette demand falls in a narrow range of –0.3 to –0.5, suggesting that a 10% increase in the price of cigarettes would decrease overall adult consumption of cigarettes by approximately 4% (NCI, 1993). A smaller literature on youth and young adult responsiveness to cigarette prices has also emerged. The consensus from these studies is that youth and young adults are at least as responsive to price as adults are, if not significantly more price responsive (USDHHS, 1994).

Using data taken from Cycle III of the Health Examination survey (1966-1970), Lewit and colleagues (1981) were the first to examine the determinants of adolescent (12-17 years old) cigarette smoking. They examine the impact of price on smoking prevalence and then examine the impact of price on the number of cigarettes smoked by adolescent smokers. The total price elasticity of demand was estimated to be –1.44. In addition, the study found price to have a larger impact on adolescents' decisions to smoke rather than on average amount smoked by smoker.

Using a similar methodology to Lewit et al. (1981), Chaloupka and Grossman (1996) confirmed the finding that youth and young adults are more responsive to price changes than are adults. They employed 1992-1994 Monitoring the Future Surveys of 8th, 10th, and 12th graders in their investigation. They estimated a total price elasticity of demand for individuals mostly aged 12 –18 centered on –1.31.

More recently, Tauras and Chaloupka (1999) employed the longitudinal component of the Monitoring the Future Surveys to estimate the impact of price on young adult smoking. Using an individual-level fixed effects model, they conclude that the total price elasticity of demand for young adults is centered on –0.79. Moreover, Harris and

Chan (1999) used the 1992-1993 Tobacco Use Supplement of the Current Population Survey to estimate the impact of price on smoking by various age groups. Their estimated price elasticities ranged from –0.996 for individual's aged 15-17 to –0.329 for individual's aged 27-29. In addition, using multiple data sets, Gruber (2000) concludes that older teens (approximately 17-18 years of age) are quite sensitive to price changes with an estimated price elasticity of demand of –0.67. However, he finds price to have an insignificant impact on younger teens (approximately 13-16 years of age) smoking. Finally, Evans and Huang(1998) estimate a prevalence elasticity of –0.20 for high school seniors using annual state-level measures of smoking prevalence for high school seniors employing the 1977-1992 Monitoring the Future Surveys. However, when only the second half of the data was employed (1985-1992), the prevalence elasticity was estimated to be –0.50, suggesting that young adults are becoming more price responsive over time.

A limitation of the previous studies on the determinants of youth and young adult smoking is that they are cross-sectional in nature and are unable to model the dynamics of smoking transitions such as smoking initiation. Only two published and two unpublished studies have attempted to address the issue of youth smoking initiation. All four studies concluded that economic factors such as cigarette prices and excise taxes were insignificant determinants of youth smoking initiation.

Douglas and Hariharan (1994) were the first to model smoking initiation. They employed data from the 1978 and 1979 National Health Interview Survey: Smoking Supplement and used a split population duration model to estimate the probability that an individual would start smoking. They concluded that increases in cigarette excise taxes

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(which increase the price of cigarettes) had no influence on individuals' decisions to start smoking.

Expanding on the original study, Douglas (1998) used the 1987 National Health Interview Survey: Cancer Risk Factor Supplement to investigate individuals' decisions to start and quit smoking in the context of an economic model of addictive behavior. He employed several alternative parametric duration models in his study and concluded that past, current, and future prices of cigarettes had no impact on individuals' decisions to start smoking. Likewise, he concluded that past and current cigarette prices had no influence on individuals' decisions to quit smoking. However, Douglas concluded that increases in the future price of cigarettes would increase the likelihood that individuals quit smoking.

In a more recent unpublished study, Forster and Jones (1999) employed data taken from the British Health and Lifestyle Survey and used both semi-parametric and fully parametric duration modeling to investigate individuals' decisions to start and quit smoking. They found cigarette excise taxes to be insignificant determinants of smoking initiation. However, they concluded that increases in excise taxes would shorten the amount of time an individual smoked and thereby increase the likelihood of smoking cessation.

Finally, DeCicca, Kenkel, and Mathios (1999) used panel data taken from the National Education Longitudinal Survey of 1988 to model youth smoking initiation decisions. They employed both a smoking onset function as well as a discrete time duration model in their investigation. They concluded that both cigarette prices and excise taxes are insignificant determinants of smoking onset between 8th and 12th grade.

They further concluded that after including state fixed effects in their discrete time duration model, both cigarette prices and excise taxes had no influence on adolescent smoking initiation.

While all four previous studies made significant contributions to the economic literature on the determinants of teenage smoking by modeling smoking initiation and not simply smoking participation, the findings that cigarette prices and excise taxes are insignificant determinants of smoking behavior is at odds with a majority of the research that has been conducted throughout the past 30 years. One possible explanation why Douglas and Hariharan (1994), Douglas (1998), and Forster and Jones (1999) found insignificant price/tax effects is due to their use of cross-sectional data with retrospective information on smoking initiation. The use of retrospective information could significantly influence the estimates by introducing imperfect recall by respondents. In fact, Forster and Jones tested for recall bias in their analysis and conclude that there is strong evidence of 5 and 10 year recall bias.

A second possible explanation why Douglas and Hariharan (1994), Douglas (1998), and Forster and Jones (1999) found insignificant price/tax effects stems from a likely price-matching problem. All three studies based all previous prices/taxes that an individual would have paid for cigarettes on that individual's current location of residence (either state or country level). If an individual lived in a different location any time in the past, that individual would have been matched with an incorrect price/tax.

While DeCicca, Kenkel, and Mathios (1999) concluded that both cigarette prices and taxes are insignificant determinants of smoking initiation when state fixed effects were included, they warned that these results should be viewed with caution because

prices and taxes were only measured at three different periods of time and when state fixed effects were excluded, both prices and taxes had significant and negative impacts on smoking initiation. The use of state level fixed effects restricts the variation of prices/taxes to nominal changes in prices/taxes within a state over time. If there is no significant variation within a state over time, the effect of price on initiation would likely be washed out. Furthermore, Dee and Evans (1998) reevaluated the NELS data that DeCicca et al. used, making adjustments to the way in which the sample was constructed and variables were defined, and concluded that price had a strong negative impact on the smoking onset functions contradicting the DeCicca et al. conclusions.

Finally, very few studies have examined the impact youth access restrictions have on youth smoking behavior. DeCicca et al. (1999) concluded that youth access laws have no influence on smoking initiation. Chaloupka and Grossman (1996) and Rigotti et al. (1997) found youth access laws to have little or no influence on cigarette demand of youth and young adults. However, Chaloupka and Pacula (1998) found that teenagers who live in states that aggressively enforce retail youth access compliance are less likely to smoke and smoke less on average than teens who live in states that do not have comprehensive enforcement. Finally, Jason et al. (1991) found that active enforcement of youth access laws in Woodridge, IL caused a significant decrease in regular smoking among adolescents.

To summarize, the economic literature on adolescent cigarette demand is conflicting. Cross-sectional analyses of cigarette demand have found that cigarette prices (or cigarette excise taxes) and the probability of youth smoking are inversely related. However, studies that have modeled the determinants of youth smoking initiation have

concluded that price is an insignificant determinant of smoking onset. Finally, the findings regarding youth access laws and adolescent cigarette demand are mixed. This paper proposes to address these issues and examine the impact cigarette prices and youth access restrictions have on adolescent's decisions to initiate cigarette smoking using longitudinal data derived from large national samples.

III. Data and Methods

The data are taken from the nationally representative longitudinal surveys of 8th and 10th graders conducted by the Institute for Social Research at the University of Michigan as part of the Monitoring the Future project (Bachman, Johnston, and O'Malley, 1996; and Johnston, O'Malley, and Bachman, 2000). These surveys focus on the use of cigarettes, alcohol, and illicit drugs. This is an extremely relevant and important time in an individual's life span to start tracking smoking behavior. According to the 1994 Surgeon General's report, very few individuals start smoking daily before the 8th grade and nearly all first use of cigarettes occurs before high school graduation.

The data used for these analyses were collected on three cohorts of students enrolled in 8th and 10th grade in 1991, 1992, and 1993. In each of these years, approximately 15,000 10th graders and between 18,000 and 19,000 8th graders were surveyed. From each cohort, 2,000 8th graders and 2,000 10th graders were selected to be followed-up via mail surveys. Students who were deemed to be at high risk for dropping out of school were over-sampled. Weights are used in the analyses to adjust for the differential sampling. Follow-up surveys were conducted at two-year intervals for up to

3 follow-ups on 8th grade cohorts and up to 2 follow-ups on the 10th grade cohorts.[1] The

questionnaires used in the follow-up surveys are very similar to those used in the baseline

years. Most of the questions asked at baseline were also asked in subsequent follow-ups

so that changes in behaviors and experiences can be measured.

Cigarette consumption, socioeconomic, and demographic variables were

constructed from the survey data for all respondents. Of particular importance to this

paper was the information collected on each individual's smoking behavior. In the

baseline year and all subsequent follow-ups, each individual was asked the following

question: "How frequently have you smoked cigarettes during the past 30 days?" The

possible responses to this question were: not at all; <1 cigarette per day; 1-5 cigarettes per

day; about ½ pack per day; about 1 pack per day; about 1 ½ packs per day; and 2 packs or

more per day. The responses to this question were used to create three alternative

dichotomous smoking variables. The first is equal to one if the respondent indicated

consuming any cigarettes in the past thirty days, and equal to zero otherwise. The second

is equal to one if the individual indicated consuming at least 1-5 cigarettes per day, and

equals zero otherwise. The third is equal to one if the individual consumed at least ½

pack of cigarettes each day, and is equal to zero otherwise. Tracked over time, the

dichotomous smoking variables allow us to examine whether or not an individual has

initiated cigarette smoking between waves of data using three alternative measures of

initiation. Only individuals who have never smoked in all previous waves of data are

allowed to enter the risk pool and subsequently initiate smoking based on one or more of

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[1] In 1997, MTF discontinued tracking 10th graders in their follow-up surveys. Therefore, the data set
consist of 3 follow-ups on 8th graders and 2 follow-ups on 10th graders, corresponding to having up to 4
observations on each 8th grader and up to 3 observations on each 10th grader.

the alternative measure. Once an individual has initiated, they are no longer at risk of initiating and are dropped from the risk pool.

In addition to the cigarette consumption variables, several independent variables were selected to control for factors that are thought likely to influence smoking initiation. These include: the age of the respondent, in years; the age of the respondent squared; average real weekly income from employment (deflated by the national consumer price index (CPI) 1982-1984=100); number of years of formal schooling completed; average number of hours worked weekly; number of children; race/ethnicity (African American, Mexican, Cuban, Puerto Rican, Other Latin, Asian American, Other Race, White – omitted); gender (male, female – omitted); indicators of family structure (live with parents, live alone); separate indicators of father's education and mother's education (some high school, high school graduate, some college, college graduate, completed graduate school, education unknown, completed grade school or less – omitted); indicators of mother's work status (mother works part-time, mother works full-time, mother does not work – omitted); indicators of frequency of participation in religious services (infrequent participation, moderate participation, frequent participation, no participation – omitted); and indicators of marital status (engaged, separated/divorced, single, married-omitted). Moreover, since attrition may be associated with smoking initiation, a variable reflecting the number of observations that each individual contributes to the full sample was created.

In addition, indicators of region according to the Bureau of Labor Statistics (New England, New Jersey/New York, East, Southeast, Midwest, Plains, Northwest, West, and

South –omitted) as well as two time variables (year and year squared) were constructed to control for region and time trends.

Based on state level identifiers, cigarette prices were added to the survey data. The price data were obtained from Tobacco Institute's <u>Tax Burden on Tobacco</u>. Each year prior to 1999, the Tobacco Institute published the average price of a pack of twenty cigarettes as of November 1 for each state. These prices are inclusive of state level sales taxes applied to cigarettes, but are exclusive of local cigarette taxes. Since the price published is as of November 1, and the survey is conducted between mid February and early June and the dependent variables are based on past month smoking, a weighted average price for the first six months of each year is computed. The average price for the first six months of every year is calculated by subtracting state and federal excise taxes from the current year's price and the previous year's price and weighting the pre-tax prices accordingly (7/12 previous year and 5/12 current year). Then the average federal tax and average state tax for the first six months of the year are added to the first six month's average pretax price. To account for changes in the relative price of cigarettes over time, all cigarette prices are deflated by the national Consumer Price Index published by the Bureau of Labor Statistics (1982-1984=100).

Based on state identifiers, a set of variables reflecting the presence and magnitude of youth access laws was added to the data. These data were obtained from the American Lung Association's annual <u>State Legislated Actions on Tobacco Issues</u>. Each year, the American Lung Association publishes data on states' activities to restrict availability of tobacco products by minors. These data were used to construct a variable that captures the minimum age required to purchase cigarettes in each state. In addition, these data

were used to construct indicators for states that restrict distribution of free tobacco samples to minors, restrict placement of cigarette vending machines, require minimum purchase age signs on vending machines, require minimum purchase age signs at point of sale, and require vendors to pay monetary fines and face possible license revocation for selling to minors. These indicators are interacted with a variable that reflects whether or not an individual is a minor, so that only minors in the analyses will be affected by youth access laws. A minor is defined as any individual whose age is less than the minimum legal cigarette purchase age. In addition, a dichotomous variable is constructed that is equal to one if a state has a law that restricts students from smoking in public schools and is equal to zero otherwise. Finally, a youth access index variable was created in an attempt to capture the magnitude of each states laws with respect to youth smoking. The index variable takes on the value of 1 if the respondent is a minor and resides in a state that has exactly 1 of the following laws: minimum purchase age, free samples restriction to minors, vending machine sign posting restriction, vending machine placement restriction, minimum age sign posting restriction, vendor penalty, and school restrictions[2]. Similarly, the index variable takes on a value of 0, 2, 3, 4, 5, 6 and 7 if the state has exactly 0, 2, 3, 4, 5, 6 or 7 of the above mentioned youth access laws.

A discrete-time hazard model is used to assess the impact exogenous covariates have on adolescent's probability of starting smoking. The dependent variable is known as the starting hazard. The starting hazard can be defined as the probability that an individual starts smoking in a given time period conditional on not having smoked in any previous wave of data. This probability is modeled using weighted dichotomous probit equation in all model specifications. The weights are used to account for the over-

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[2] It is not required that a respondent be a minor for the school restriction to take a value of one in the index.

sampling of high-risk individuals in the sample.[3] In addition, to account for the

correlation among multiple observations on an individual subject a Huber/White robust

method of calculating the variance-covariance matrix is used. The robust estimator

relaxes the assumption of independence of observations by allowing the observations to

be independent across individuals, but not independent within an individual.[4] Only

individuals at risk of initiating cigarette smoking are allowed to enter the model.

Therefore, only individuals who had not started to smoke as of the previous wave are

allowed to enter the risk pool and subsequently enter into the model estimation. Since

adequate information on prior smoking by the 10th grade cohorts is not known, and since

many youth start smoking between 8th and 10th grade, all baseline observations for the

10th grade cohorts are eliminated from the risk pool. However, since very few 6th graders

are classified as current smokers, it is assumed that all baseline observations for the 8th

grade cohorts are at risk of smoking initiation and therefore are allowed to enter the risk

pool. This is equivalent to estimating the probability of smoking initiation between some

earlier period and 8th grade for the 8th grade baseline observations. A total of 15,548

observations in the data representing 8,447 adolescents are at risk of making a transition

from the non-smoking state to the smoking state. Of these 8,447 individuals, 35.23%,

18.65%, and 9.49% initiate smoking during the time they are under observation based on

initiation defined as smoking any cigarettes in the past thirty days, smoking at least 1-5

cigarettes per day on average in the past month, and smoking at least a half a pack per

day on average in the past month respectively.

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[3] Non weighted probit equations and weighted probit equations to account for attrition were also
performed. In the latter, the number of observations that each individual contributes to the full sample is
not employed as a covariate. The results are very similar to those presented in the paper and are available
upon request.

IV. Results

Table 2 contains estimates from the smoking initiation equations when initiation is defined as smoking any cigarettes in the previous 30 days, with the corresponding estimates for initiation defined as smoking at least 1 to 5 cigarettes per day on average presented in Table 3, and estimates for initiation defined as smoking at least ½ pack per day on average presented in Table 4. Each Table contains ten alternative models. Model 1 of each table contains estimates from a specification that includes the real average price of cigarettes, gender, age, race/ethnicity, living arrangement, parental education, mother's work status, religious participation, marital status, number of children, hours worked, education, income, number of observations per individual in the full sample, year, and region. Model 2 of each table is identical to model 1 except model 2 includes a youth access index variable. The models estimated in columns 3 through 9 are identical to model 1, except models 3 through 9 include at most one tobacco control policy. These models are specifically designed to decrease the collinearity associated with including highly correlated state level variables. Finally, model 10 is identical to model 1 except model 10 includes all seven tobacco control policies. In addition, with the exception of price, time trend, region, age, and indicators of family structure, indicators for respondents with missing data for all of the above variables are included in the models. These missing value indicators were created to prevent the loss of a large number of observations. In the case of discrete covariates with missing data, the missing value dummy variables take the value of one, while the covariates take on a value of zero. In

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[4] Additional models in which clustering was based on zip code were also estimated. The results are very similar to those included in the paper. These estimates are available upon request.

the case of continuous covariates with missing data, the missing value indicators take the value of one and the covariates take the value that has been imputed at the mean of the individual's other observations. The missing value indicators take a value of zero for all respondents whose covariates are known.

The real price of cigarettes is found to have a negative and significant impact at the 1% significance level on smoking initiation in all the models that were estimated when initiation is based on smoking at least 1 to 5 cigarettes per day on average and at least ½ pack per day on average. In addition, the real price of cigarettes is found to have a negative impact on smoking initiation defined as smoking any cigarettes in the past 30 days, however, this relationship is significant at the 10% level in only models 7 and 9. The estimated price elasticities of initiation[5] are presented in Table 5. The average price elasticity of initiation based on any smoking, at least 1-5 cigarettes per day on average, and at least ½ pack per day on average are –0.271, -0.811, and –0.955 respectively. These estimates clearly indicate that increases in the real price of cigarettes (which can be achieved through excise taxation) will decrease the number of adolescents who start smoking. The results above indicate that a 10% increase in the price of cigarettes will decrease the probability of smoking initiation between approximately 3% and 10% depending on how initiation is defined. In addition, these results suggest that individuals who are classified as having initiated smoking based on greater cigarettes smoked are more price responsive than are individuals classified as having initiated smoking based on fewer cigarettes smoked. This is not surprising given that many adolescents who

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[5] The price elasticity of initiation is defined as $\varepsilon_{ip} = \left(\dfrac{\partial initiation}{\partial price} \right) \left(\dfrac{\overline{price}}{\overline{initiation}} \right)$

experiment with cigarettes or smoke in small quantities never purchase their own cigarettes, but rather "borrow" from a friend.

To control for the possibility that unobserved state level sentiment toward smoking is causing both the excise taxes to increase as well as decrease adolescent smoking initiation, alternative models are run that replaced the region fixed effects with state fixed effects. To conserve space, the estimates are not presented here, but are available upon request. Price has a negative and significant impact on all three measure of smoking initiation except in model 10 when initiation is defined as any cigarettes consumed in the previous 30 days. The estimated price elasticities of initiation from these models are presented in Table 6. The average price elasticity of initiation based on smoking any cigarettes, smoking at least 1 to 5 cigarettes per day on average and smoking at least ½ pack per day on average are –0.111, –1.23 and –1.43 respectively. These results imply that when unobserved state level sentiment is controlled for, cigarette price increases have a larger impact on deterring adolescents from initiating into daily smoking than when state sentiment is not controlled for.

The results are mixed with respect to youth access restrictions. The youth access index variable, designed to capture the magnitude of each states youth smoking restrictions, has an insignificant impact on all three measures of smoking initiation. Minimum purchase age laws are found to have a negative and significant impact at at least the 10% significance level on smoking initiation in all the models except when initiation is defined as smoking at least 1 to 5 cigarettes per day on average and all the tobacco control policies are included in the model. Restrictions on smoking in public schools seem to have little or no impact on the two stricter measures of smoking

initiation, however, restrictions on smoking in public schools seem to have a negative and significant impact at at least the 10% level on smoking initiation defined as smoking any cigarettes in the past month. Restrictions on the distribution of free samples to minors decrease the probability of smoking initiation based on initiation defined as smoking at least 1 to 5 cigarettes per day on average in the past month, however, these restrictions fail to meet statistical significance at conventional levels when smoking initiation is defined as smoking any cigarettes and smoking at least ½ pack per day on average. Point of sale minimum age sign requirements (including both store and vending machine sign postings), vending machine placement, and penalties to vendors who sell to minors seem to have little or no impact on curtailing adolescent smoking initiation.

Briefly reviewing the results from the other independent variables, controlling for all other variables: Males are more likely to start smoking than are females when initiation is based on smoking at least ½ packs per day on average. Young adolescents are much more likely to initiate cigarette smoking than are older adolescents. With respect to race/ethnicity, African Americans, Mexicans, Asian Americans, and Other Latin races are significantly less likely to start smoking than are Whites. Adolescents who live with at least one or more of their parents are significantly less likely to initiate cigarette smoking than those that do not live with a parent.

Paternal education does not seem to be a strong predictor of smoking initiation, although, based on a one-tail test, individuals whose fathers have a college degree or have an advanced professional degree are less likely to start smoking than those whose fathers have less than a high school education when initiation is defined as smoking at least ½ pack per day on average. Individuals whose mothers work part-time are significantly less

likely to initiate smoking than individuals whose mothers do not work based on initiation defined as smoking at least 1 to 5 cigarettes per day on average and smoking at least ½ pack per day on average.

Adolescents with a strong attachment to religion, as measured by the frequency of religious service attendance, are much less likely to start smoking than are adolescents with little or no attachment to religion. Based on a one-tail test at at least the 10% significance level, individuals who are engaged, single, or are either separated or divorced are significantly more likely to start smoking than are individuals who are married.

Adolescents with more children are significantly less likely to initiate smoking than adolescents with fewer children based on initiation defined as smoking any cigarettes during the past 30 days. Adolescents who work more hours per week are more likely to initiate cigarette smoking than individuals who work fewer hours per week based on a one-tail test at at least the 10% significance level. Individuals with more formal years of schooling are significantly less likely to initiate cigarette smoking than are individuals who have less education. Finally, adolescents with higher incomes from employment are significantly more likely to initiate cigarette smoking based on initiation defined as smoking at least 1 to 5 cigarettes per day and smoking at least ½ pack per day on average.

V. Discussion

For the better part of the 1990's, cigarette smoking among American teenagers has been on the rise. Many proposals have been drafted by policy makers in an attempt to combat this upward trend. At the heart of almost every proposal is a tax increase that

would substantially increase the price of cigarettes. Decreasing smoking initiation among America's young people was one of President Clinton's top domestic priorities during his second term in office. On February 7, 2000, President Clinton unveiled his proposed budget for fiscal year 2001which contained several important tobacco-related initiatives including a 25-cent excise tax increase on cigarettes.[6]

While the use of economic incentives (such as tax increases) to decrease youth smoking initiation have found their way into almost all anti-smoking proposals, prior research has suggested that price and tax increases would have little or no influence on youth smoking initiation. The research presented here, however, contradicts those previous studies. The average estimates provided above suggest that had a 10% increase in the federal excise tax been enacted during the time of this study, and had that tax been fully passed on to consumers, the probability of daily smoking initiation among youth would have declined by approximately 10%.

With respect to other youth tobacco control policies, the estimates above suggest that minimum purchase age laws, restrictions on smoking in public schools, and restrictions on distribution of free tobacco samples could possibly be effective tools in decreasing smoking initiation. Other youth access laws such as minimum purchase age sign postings at point of sale and on vending machines, vending machine placement requirements, and penalties for vendor sale violations seem to have little impact on youth smoking initiation. However, the state-level youth tobacco control policies used in this analysis may underestimate the true impact smoking restrictions have on youth smoking

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[6] Other tobacco initiatives included: increasing the prices of smokeless tobacco and cigars; moving the already legislated 5 cent per pack excise tax increase slated for January 1, 2002 to October 1, 2000; imposing assessments on tobacco companies for underage smoking; ensuring Medicaid patients have access to medication that aids in smoking cessation; providing $39 million to the Food and Drug

initiation because they do not account for local level policies, they do not take account of

the level of enforcement that takes place within states, and there may not be enough

variation in the existence of these policies during the period under study here.

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Table 1

Variables	Definition, Baseyear Mean (μ_B), Baseyear Standard Deviation (σ_B), At Risk Mean(μ_R), At Risk Standard Deviation (σ_R)
Real Cigarette Price	Average price of a pack of twenty cigarettes for the first two quarters of the year, deflated by the national Consumer Price Index, 1982-1984=100. μ_B=1.26　σ_B=0.127　μ_R=1.22　σ_R=0.145
Youth Access Index	Index variable that takes on the value of 1 if the respondent is a minor and resides in a state that has exactly 1 of the following laws: minimum purchase age, free samples restriction to minors, vending machine sign posting restriction, vending machine placement restriction, minimum age sign posting restriction, vendor penalty, and school restrictions[7]. Similarly, the index variable takes on a value of 0, 2, 3, 4, 5, 6 and 7 if the state has exactly 0, 2, 3, 4, 5, 6 or 7 of the above mentioned youth access laws. μ_B=3.88　σ_B=1.29　μ_R=3.61　σ_R=1.61
Minimum Purchase Age	Age required to purchase cigarettes. μ_B=17.82　σ_B=2.06　μ_R=18.002　σ_R=1.52
School Restriction	Dichotomous indicator equal to one if respondent resides in a state that restricts cigarette smoking in public schools and zero otherwise. μ_B=0.859　σ_B=0.348　μ_R=0.88　σ_R=0.325
Distribution of Free Samples	Dichotomous indicator equal to one if respondent is a minor and resides in a state that restricts the distribution of free tobacco products to minors, and zero otherwise. μ_B=0.481　σ_B=0.499　μ_R=0.433　σ_R=0.496
Vending Machine Sign	Dichotomous indicator equal to one if respondent is a minor and resides in a state that requires minimum purchase age signs to be posted on vending machines, and zero otherwise. μ_B=0.403　σ_B=0.491　μ_R=0.327　σ_R=0.469
Vending Machine Placement	Dichotomous indicator equal to one if respondent is a minor and resides in a state that restricts the placement of vending machines to areas not accessible by minors, and zero otherwise. μ_B=0.361　σ_B=0.480　μ_R=0.334　σ_R=0.472
Minimum Age Sign	Dichotomous indicator equal to one if respondent is a minor and resides in a state that requires minimum purchase age signs to be posted at point of sale, and zero otherwise. μ_B=0.761　σ_B=0.426　μ_R=0.561　σ_R=0.496
Vendor Penalty	Dichotomous indicator equal to one if respondent is a minor and resides in a state that penalizes vendors with monetary fines and possible revocation of license to vendors who sell tobacco to minors, and zero otherwise. μ_B=0.03　σ_B=0.167　μ_R=0.08　σ_R=0.271
Male	Dichotomous indicator equal to one if respondent is a male, and zero otherwise. μ_B=0.510　σ_B=0.499　μ_R=0.476　σ_R=0.499
Age	Age of respondent, in years. μ_B=15.3　σ_B=1.68　μ_R=16.94　σ_R=2.56
Age Squared	Age of respondent squared. μ_B=236.86　σ_B=51.21　μ_R=293.61　σ_R=86.71
African American	Dichotomous indicator equal to one if respondent is African American, and zero otherwise. μ_B=0.155　σ_B=0.362　μ_R=0.163　σ_R=0.369

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[7] It is not required that a respondent be a minor for the school restriction to take a value of one in the index.

Mexican	Dichotomous indicator equal to one if respondent is Mexican, and zero otherwise. $\mu_B=0.092$ $\sigma_B=0.288$ $\mu_R=0.087$ $\sigma_R=0.028$
Cuban	Dichotomous indicator equal to one if respondent is Cuban, and zero otherwise. $\mu_B=0.008$ $\sigma_B=0.086$ $\mu_R=0.006$ $\sigma_R=0.078$
Puerto Rican	Dichotomous indicator equal to one if respondent is Puerto Rican, and zero otherwise. $\mu_B=0.012$ $\sigma_B=0.111$ $\mu_R=0.010$ $\sigma_R=0.098$
Other Latin	Dichotomous indicator equal to one if respondent is of other Latin American descent, and zero otherwise. $\mu_B=0.016$ $\sigma_B=0.126$ $\mu_R=0.015$ $\sigma_R=0.121$
Asian American	Dichotomous indicator equal to one if respondent is Asian American, and zero otherwise. $\mu_B=0.019$ $\sigma_B=0.136$ $\mu_R=0.021$ $\sigma_R=0.144$
Other Race	Dichotomous indicator equal to one if respondent is from another race not mentioned above, and zero otherwise. $\mu_B=0.097$ $\sigma_B=0.296$ $\mu_R=0.104$ $\sigma_R=0.306$
Live Parents	Dichotomous indicator equal to one for individuals who live with one or more of their parents, and zero otherwise. $\mu_B=0.93$ $\sigma_B=0.255$ $\mu_R=0.866$ $\sigma_R=0.340$
Live Alone	Dichotomous indicator equal to one for individuals who live alone, and zero otherwise. $\mu_B=0.004$ $\sigma_B=0.067$ $\mu_R=0.010$ $\sigma_R=0.098$
Father Some High School	Dichotomous indicator equal to one if father attended high school, but did not graduate, and zero otherwise. $\mu_B=0.135$ $\sigma_B=0.342$ $\mu_R=0.120$ $\sigma_R=0.325$
Father High School Graduate	Dichotomous indicator equal to one if father graduated from high school, but did not attend college, and zero otherwise. $\mu_B=0.271$ $\sigma_B=0.445$ $\mu_R=0.267$ $\sigma_R=0.442$
Father Some College	Dichotomous indicator equal to one if father attended college, but did not graduate, and zero otherwise. $\mu_B=0.125$ $\sigma_B=0.330$ $\mu_R=0.121$ $\sigma_R=0.327$
Father College Graduate	Dichotomous indicator equal to one if father graduated from college, but pursued no further education, and zero otherwise. $\mu_B=0.185$ $\sigma_B=0.388$ $\mu_R=0.200$ $\sigma_R=0.400$
Father Professional	Dichotomous indicator equal to one if father earned a graduate degree in a professional occupation, and zero otherwise. $\mu_B=0.099$ $\sigma_B=0.299$ $\mu_R=0.111$ $\sigma_R=0.314$
Father Education Unknown	Dichotomous indicator equal to one if father's education is unknown, and zero otherwise. $\mu_B=0.121$ $\sigma_B=0.326$ $\mu_R=0.120$ $\sigma_R=0.328$
Mother Some High School	Dichotomous indicator equal to one if mother attended high school, but did not graduate, and zero otherwise. $\mu_B=0.152$ $\sigma_B=0.359$ $\mu_R=0.133$ $\sigma_R=0.340$
Mother High School Graduate	Dichotomous indicator equal to one if mother graduated from high school, but did not attend college, and zero otherwise. $\mu_B=0.309$ $\sigma_B=0.462$ $\mu_R=0.301$ $\sigma_R=0.459$
Mother Some College	Dichotomous indicator equal to one if mother attended college, but did not graduate, and zero otherwise. $\mu_B=0.151$ $\sigma_B=0.358$ $\mu_R=0.157$ $\sigma_R=0.364$
Mother College Graduate	Dichotomous indicator equal to one if mother graduated from college, but pursued no further education, and zero otherwise. $\mu_B=0.178$ $\sigma_B=0.382$ $\mu_R=0.189$ $\sigma_R=0.391$
Mother Professional	Dichotomous indicator equal to one if mother earned a graduate degree

	in a professional occupation, and zero otherwise. μ_B=0.088 σ_B=0.283 μ_R=0.098 σ_R=0.297
Mother Education Unknown	Dichotomous indicator equal to one if mother's education is unknown, and zero otherwise. μ_B=0.070 σ_B=0.255 μ_R=0.074 σ_R=0.261
Mother Works Part-Time	Dichotomous indicator equal to one if mother works part-time, and zero otherwise. μ_B=0.176 σ_B=0.381 μ_R=0.177 σ_R=0.381
Mother Works Full-Time	Dichotomous indicator equal to one if mother works full-time, and zero otherwise. μ_B=0.567 σ_B=0.495 μ_R=0.566 σ_R=0.496
Infrequent Religion	Dichotomous indicator equal to one for individuals who attend religious services infrequently and zero otherwise. μ_B=0.323 σ_B=0.468 μ_R=0.341 σ_R=0.474
Moderate Religion	Dichotomous indicator equal to one for individuals who attend religious services once or twice a month and zero otherwise. μ_B=0.163 σ_B=0.369 μ_R=0.166 σ_R=0.372
Frequent Religion	Dichotomous indicator equal to one for individuals who attend religious services at least once a week and zero otherwise. μ_B=0.357 σ_B=0.479 μ_R=0.343 σ_R=0.475
Engaged	Dichotomous indicator equal to one for individuals who are engaged, and zero otherwise. μ_B=not asked σ_B= not asked μ_R=0.043 σ_R=0.202
Separated / Divorced	Dichotomous indicator equal to one for individuals who are separated or divorced, and zero otherwise. μ_B= not asked σ_B= not asked μ_R=0.006 σ_R=0.079
Single	Dichotomous indicator equal to one for individuals who are single, and zero otherwise. μ_B= not asked σ_B= not asked μ_R=0.578 σ_R=0.494
Number of Children	Number of children the respondent has. μ_B= not asked σ_B= not asked μ_R=0.06 σ_R=0.288
Hours Worked	Number of hours worked per week in the past thirty days. μ_B=4.63 σ_B=8.24 μ_R=10.81 σ_R=14.39
Formal School Years	Number of formal school years completed. μ_B=8.018 σ_B=0.999 μ_R=9.34 σ_R=2.07
Real Income	Average real weekly income from employment sources only (in dollars), deflated by the national Consumer Price Index, 1982-1984=100. μ_B=0.160 σ_B=0.271 μ_R=0.441 σ_R=0.709
Number of Observations	Number of observations that each individual contributes to the full sample. μ_B=NA σ_B=NA μ_R=NA σ_R=NA
New England	Dichotomous indicator equal to one if individual resides in Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, or Vermont and zero otherwise. μ_B=0.045 σ_B=0.206 μ_R=0.044 σ_R=0.203
New York/ New Jersey	Dichotomous indicator equal to one if individual resides in New Jersey or New York and zero otherwise. μ_B=0.097 σ_B=0.295 μ_R=0.099 σ_R=0.299
East	Dichotomous indicator equal to one if individual resides in Pennsylvania, Delaware, District of Columbia, Maryland, Virginia, or West Virginia and zero otherwise. μ_B=0.088 σ_B=0.283 μ_R=0.097 σ_R=0.296
South East	Dichotomous indicator equal to one if individual resides in Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, or Tennessee and zero otherwise.

	μ_B=0.184 σ_B=0.388 μ_R=0.185 σ_R=0.388
Midwest	Dichotomous indicator equal to one if individual resides in Illinois, Indiana, Michigan, Minnesota, Ohio, or Wisconsin and zero otherwise. μ_B=0.181 σ_B=0.385 μ_R=0.180 σ_R=0.384
South	Dichotomous indicator equal to one if individual resides in Arkansas, Louisiana, New Mexico, Oklahoma, or Texas and zero otherwise. μ_B=0.121 σ_B=0.326 μ_R=0.114 σ_R=0.318
Plains	Dichotomous indicator equal to one if individual resides in Nebraska, Iowa, Kansas, or Missouri and zero otherwise. μ_B=0.067 σ_B=0.251 μ_R=0.072 σ_R=0.258
Mountain	Dichotomous indicator equal to one if individual resides in Colorado, Montana, North Dakota, South Dakota, Utah, or Wyoming and zero otherwise. μ_B=0.052 σ_B=0.222 μ_R=0.044 σ_R=0.206
West	Dichotomous indicator equal to one if individual resides in Arizona, California, Hawaii, or Nevada, and zero otherwise. μ_B=0.141 σ_B=0.348 μ_R=0.141 σ_R=0.348
Northwest	Dichotomous indicator equal to one if individual resides in Washington, Oregon, Idaho, or Alaska and zero otherwise. μ_B=0.025 σ_B=0.155 μ_R=0.025 σ_R=0.156

Table 2
Smoking Initiation Equations – Any Cigarettes Smoked in the Previous 30 days

Independent Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Real Cigarette Price	-0.177	-0.171	-0.133	-0.118	-0.169	-0.173	-0.181	-0.175	-0.205	-0.115
	(-1.27)	(-1.21)	(-0.95)	(-0.82)	(-1.20)	(-1.23)	(-1.29)	(-1.25)	(-1.45)	(-0.79)
Youth Access Index		-0.006								
		(-0.48)								
Minimum Purchase Age			-0.024							-0.019
			(-2.85)							(-2.11)
School Restriction				-0.119						-0.088
				(-2.02)						(-1.38)
Distribution of Free Samples					-0.021					-0.025
					(-0.64)					(-0.63)
Vending Machine Sign						0.010				0.015
						(0.28)				(0.39)
Vending Machine Placement							0.014			0.013
							(0.39)			(0.31)
Minimum Age Sign								-0.027		-0.009
								(-0.68)		(-0.20)
Vendor Penalty									0.103	0.112
									(1.79)	(1.84)
Male	-0.045	-0.045	-0.045	-0.045	-0.045	-0.045	-0.045	-0.045	-0.044	-0.044
	(-1.52)	(-1.52)	(-1.52)	(-1.53)	(-1.51)	(-1.51)	(-1.52)	(-1.51)	(-1.49)	(-1.49)
Age	0.255	0.262	0.254	0.253	0.261	0.252	0.251	0.264	0.240	0.239
	(3.08)	(3.11)	(3.07)	(3.06)	(3.12)	(3.04)	(3.03)	(3.13)	(2.91)	(2.85)
Age Squared	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.006
	(-2.73)	(-2.76)	(-2.72)	(-2.71)	(-2.78)	(-2.68)	(-2.67)	(-2.79)	(-2.54)	(-2.47)
African American	-0.644	-0.644	-0.648	-0.655	-0.644	-0.645	-0.644	-0.643	-0.641	-0.653
	(-13.32)	(-13.33)	(-13.37)	(-13.44)	(-13.32)	(-13.30)	(-13.31)	(-13.29)	(-13.25)	(-13.34)
Mexican	-0.263	-0.263	-0.266	-0.263	-0.264	-0.263	-0.262	-0.260	-0.261	-0.265
	(-4.07)	(-4.07)	(-4.12)	(-4.07)	(-4.09)	(-4.07)	(-4.06)	(-4.03)	(-4.04)	(-4.09)
Cuban	0.167	0.170	0.165	0.204	0.168	0.168	0.167	0.172	0.167	0.194
	(0.88)	(0.89)	(0.86)	(1.06)	(0.88)	(0.88)	(0.88)	(0.90)	(0.88)	(1.01)
Puerto Rican	0.008	0.008	0.010	0.011	0.009	0.009	0.007	0.008	0.012	0.017
	(0.05)	(0.05)	(0.06)	(0.07)	(0.06)	(0.06)	(0.05)	(0.05)	(0.08)	(0.11)

Other Latin	-0.203	-0.203	-0.209	-0.195	-0.204	-0.203	-0.204	-0.203	-0.205	-0.205
	(-1.55)	(-1.55)	(-1.59)	(-1.48)	(-1.56)	(-1.55)	(-1.55)	(-1.55)	(-1.56)	(-1.55)
Asian American	-0.397	-0.397	-0.402	-0.396	-0.397	-0.398	-0.397	-0.397	-0.398	-0.402
	(-3.60)	(-3.59)	(-3.65)	(-3.58)	(-3.60)	(-3.60)	(-3.60)	(-3.59)	(-3.61)	(-3.64)
Other Race	-0.019	-0.019	-0.018	-0.020	-0.019	-0.018	-0.019	-0.019	-0.019	-0.019
	(-0.42)	(-0.42)	(-0.39)	(-0.44)	(-0.41)	(-0.41)	(-0.42)	(-0.42)	(-0.43)	(-0.41)
Live With Parents	-0.190	-0.191	-0.193	-0.191	-0.191	-0.190	-0.190	-0.190	-0.188	-0.191
	(-3.72)	(-3.73)	(-3.77)	(-3.74)	(-3.73)	(-3.73)	(-3.71)	(-3.73)	(-3.68)	(-3.74)
Live Alone	-0.060	-0.059	-0.061	-0.058	-0.058	-0.060	-0.060	-0.059	-0.062	-0.059
	(-0.38)	(-0.37)	(-0.38)	(-0.37)	(-0.37)	(-0.38)	(-0.37)	(-0.37)	(-0.39)	(-0.37)
Father Some High School	0.005	0.005	0.010	0.001	0.006	0.005	0.005	0.005	0.004	0.006
	(0.06)	(0.05)	(0.11)	(0.01)	(0.06)	(0.06)	(0.06)	(0.05)	(0.05)	(0.07)
Father High School Graduate	-0.024	-0.024	-0.021	-0.026	-0.023	-0.024	-0.024	-0.025	-0.026	-0.024
	(-0.27)	(-0.27)	(-0.24)	(-0.30)	(-0.26)	(-0.27)	(-0.27)	(-0.28)	(-0.29)	(-0.27)
Father Some College	0.016	0.016	0.020	0.014	0.016	0.017	0.016	0.016	0.015	0.017
	(0.17)	(0.17)	(0.20)	(0.15)	(0.17)	(0.17)	(0.17)	(0.17)	(0.16)	(0.18)
Father College Graduate	-0.059	-0.059	-0.053	-0.062	-0.059	-0.059	-0.059	-0.059	-0.062	-0.059
	(-0.64)	(-0.64)	(-0.58)	(-0.67)	(-0.64)	(-0.64)	(-0.64)	(-0.64)	(-0.67)	(-0.64)
Father Professional	-0.048	-0.048	-0.043	-0.051	-0.047	-0.047	-0.048	-0.048	-0.049	-0.047
	(-0.48)	(-0.48)	(-0.43)	(-0.51)	(-0.48)	(-0.48)	(-0.48)	(-0.48)	(-0.49)	(-0.47)
Father Education Unknown	0.026	0.025	0.028	0.022	0.026	0.026	0.026	0.025	0.024	0.025
	(0.27)	(0.26)	(0.29)	(0.23)	(0.27)	(0.27)	(0.27)	(0.26)	(0.25)	(0.26)
Mother Some High School	0.131	0.130	0.132	0.132	0.129	0.131	0.132	0.130	0.131	0.132
	(1.32)	(1.31)	(1.33)	(1.33)	(1.30)	(1.32)	(1.33)	(1.31)	(1.32)	(1.33)
Mother High School Graduate	0.074	0.074	0.074	0.075	0.074	0.074	0.075	0.074	0.074	0.074
	(0.75)	(0.75)	(0.75)	(0.76)	(0.75)	(0.75)	(0.76)	(0.75)	(0.75)	(0.75)
Mother Some College	0.028	0.027	0.031	0.029	0.027	0.028	0.029	0.027	0.028	0.031
	(0.27)	(0.27)	(0.31)	(0.28)	(0.26)	(0.27)	(0.28)	(0.27)	(0.28)	(0.30)
Mother College Graduate	0.021	0.021	0.021	0.022	0.020	0.021	0.022	0.021	0.021	0.021
	(0.21)	(0.20)	(0.20)	(0.22)	(0.19)	(0.20)	(0.21)	(0.20)	(0.21)	(0.21)
Mother Professional	0.098	0.097	0.097	0.101	0.097	0.098	0.098	0.097	0.097	0.099
	(0.89)	(0.89)	(0.88)	(0.92)	(0.89)	(0.89)	(0.89)	(0.89)	(0.89)	(0.90)
Mother Education Unknown	-0.046	-0.046	-0.046	-0.043	-0.046	-0.046	-0.045	-0.045	-0.046	-0.045
	(-0.41)	(-0.41)	(-0.42)	(-0.39)	(-0.42)	(-0.41)	(-0.41)	(-0.41)	(-0.42)	(-0.41)
Mother Occasionally Worked	-0.030	-0.030	-0.030	-0.030	-0.030	-0.030	-0.029	-0.030	-0.030	-0.031
	(-0.65)	(-0.66)	(-0.67)	(-0.66)	(-0.67)	(-0.65)	(-0.65)	(-0.66)	(-0.65)	(-0.69)

Mother Usually Worked	0.045	0.045	0.044	0.046	0.044	0.045	0.045	0.045	0.044	0.043
	(1.25)	(1.25)	(1.22)	(1.27)	(1.23)	(1.25)	(1.25)	(1.25)	(1.24)	(1.19)
Infrequent Religious Attendance	-0.115	-0.115	-0.115	-0.115	-0.115	-0.115	-0.115	-0.115	-0.116	-0.115
	(-2.69)	(-2.68)	(-2.68)	(-2.69)	(-2.68)	(-2.69)	(-2.69)	(-2.69)	(-2.70)	(-2.69)
Moderate Religious Attendance	-0.150	-0.150	-0.151	-0.152	-0.150	-0.150	-0.150	-0.150	-0.150	-0.151
	(-3.02)	(-3.02)	(-3.03)	(-3.04)	(-3.00)	(-3.01)	(-3.02)	(-3.02)	(-3.02)	(-3.03)
Frequent Religious Attendance	-0.460	-0.460	-0.461	-0.462	-0.459	-0.459	-0.459	-0.460	-0.460	-0.462
	(-10.28)	(-10.28)	(-10.31)	(-10.33)	(-10.27)	(-10.27)	(-10.28)	(-10.28)	(-10.28)	(-10.33)
Engaged	0.266	0.266	0.268	0.266	0.267	0.267	0.267	0.266	0.268	0.271
	(1.85)	(1.85)	(1.86)	(1.85)	(1.85)	(1.86)	(1.85)	(1.85)	(1.86)	(1.88)
Separated/Divorced	0.416	0.414	0.417	0.418	0.417	0.418	0.417	0.413	0.422	0.427
	(1.80)	(1.79)	(1.80)	(1.80)	(1.81)	(1.81)	(1.81)	(1.79)	(1.83)	(1.84)
Single	0.271	0.270	0.274	0.269	0.270	0.272	0.272	0.270	0.272	0.274
	(2.17)	(2.16)	(2.19)	(2.15)	(2.16)	(2.18)	(2.18)	(2.16)	(2.18)	(2.19)
Number of Children	-0.185	-0.185	-0.184	-0.187	-0.185	-0.185	-0.185	-0.185	-0.186	-0.189
	(-2.07)	(-2.07)	(-2.07)	(-2.10)	(-2.07)	(-2.07)	(-2.07)	(-2.07)	(-2.09)	(-2.12)
Hours Worked	0.006	0.006	0.006	0.007	0.006	0.006	0.006	0.006	0.006	0.007
	(3.16)	(3.16)	(3.17)	(3.20)	(3.16)	(3.16)	(3.16)	(3.16)	(3.16)	(3.18)
Formal School Years	-0.257	-0.256	-0.258	-0.256	-0.256	-0.257	-0.258	-0.256	-0.259	-0.259
	(-10.84)	(-10.78)	(-10.87)	(-10.81)	(-10.82)	(-10.84)	(-10.83)	(-10.76)	(-10.91)	(-10.86)
Real Income	-0.022	-0.022	-0.022	-0.023	-0.022	-0.022	-0.022	-0.022	-0.022	-0.023
	(-0.51)	(-0.51)	(-0.51)	(-0.55)	(-0.52)	(-0.52)	(-0.51)	(-0.51)	(-0.52)	(-0.55)
Year	-2.700	-2.560	-2.334	-2.536	-2.562	-2.738	-2.782	-2.568	-2.838	-2.364
	(-2.94)	(-2.67)	(-2.51)	(-2.75)	(-2.73)	(-2.95)	(-2.95)	(-2.74)	(-3.09)	(-2.44)
Year Squared	0.015	0.014	0.013	0.014	0.014	0.015	0.015	0.014	0.015	0.013
	(3.02)	(2.74)	(2.59)	(2.83)	(2.81)	(3.03)	(3.02)	(2.81)	(3.16)	(2.52)
nobs	-0.117	-0.117	-0.117	-0.118	-0.117	-0.117	-0.116	-0.117	-0.116	-0.117
	(-6.58)	(-6.59)	(-6.58)	(-6.65)	(-6.58)	(-6.58)	(-6.57)	(-6.59)	(-6.52)	(-6.57)
New England	-0.046	-0.045	-0.053	-0.049	-0.045	-0.045	-0.050	-0.047	-0.051	-0.061
	(-0.57)	(-0.56)	(-0.65)	(-0.61)	(-0.56)	(-0.56)	(-0.62)	(-0.58)	(-0.64)	(-0.75)
New Jersey/New York	-0.124	-0.121	-0.132	-0.129	-0.118	-0.119	-0.129	-0.124	-0.162	-0.166
	(-1.81)	(-1.76)	(-1.93)	(-1.89)	(-1.70)	(-1.68)	(-1.85)	(-1.81)	(-2.25)	(-2.21)
East	-0.027	-0.033	-0.001	-0.017	-0.022	-0.022	-0.026	-0.046	-0.026	0.009
	(-0.40)	(-0.48)	(-0.02)	(-0.25)	(-0.33)	(-0.32)	(-0.39)	(-0.64)	(-0.39)	(0.12)
Southeast	-0.122	-0.127	-0.115	-0.176	-0.117	-0.115	-0.126	-0.128	-0.132	-0.154
	(-2.04)	(-2.09)	(-1.91)	(-2.68)	(-1.93)	(-1.76)	(-2.07)	(-2.11)	(-2.19)	(-2.06)

Midwest	-0.071	-0.068	-0.071	-0.065	-0.064	-0.067	-0.078	-0.073	-0.070	-0.058
	(-1.25)	(-1.20)	(-1.24)	(-1.15)	(-1.10)	(-1.15)	(-1.30)	(-1.28)	(-1.24)	(-0.93)
Mountain	-0.157	-0.155	-0.153	-0.173	-0.156	-0.156	-0.166	-0.160	-0.156	-0.172
	(-1.88)	(-1.85)	(-1.83)	(-2.05)	(-1.87)	(-1.87)	(-1.91)	(-1.91)	(-1.88)	(-1.93)
Plains	-0.107	-0.107	-0.151	-0.108	-0.095	-0.102	-0.109	-0.115	-0.121	-0.144
	(-1.48)	(-1.48)	(-2.05)	(-1.50)	(-1.28)	(-1.39)	(-1.50)	(-1.57)	(-1.67)	(-1.77)
Northwest	-0.116	-0.117	-0.126	-0.124	-0.109	-0.108	-0.123	-0.121	-0.119	-0.120
	(-1.11)	(-1.12)	(-1.20)	(-1.17)	(-1.03)	(-0.99)	(-1.16)	(-1.15)	(-1.14)	(-1.07)
West	-0.171	-0.175	-0.175	-0.173	-0.162	-0.162	-0.171	-0.177	-0.165	-0.149
	(-2.83)	(-2.88)	(-2.89)	(-2.87)	(-2.63)	(-2.43)	(-2.84)	(-2.90)	(-2.73)	(-2.11)

All equations also include an intercept, year, year squared, eight dichotomous region indicators, number of observations per individual in the full sample, and missing value indicators for gender, race/ethnicity, type of community, father's education, mother's education, mothers work status, religious participation, marital status, children, hours worked, school years, and income. Asymptotic t-ratios are in parentheses. The critical values for the t-ratios are 2.58 (2.33), 1.96 (1.64), 1.64 (1.28) at the 1, 5, and 10% significance levels, respectively, based on a two-tailed (one-tailed) test.

Table 3
Smoking Initiation Equations – At Least 1 to 5 Cigarettes Smoked in the Previous 30 Days

Independent Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Real Cigarette Price	-0.456 (-2.73)	-0.444 (-2.66)	-0.426 (-2.54)	-0.412 (-2.43)	-0.432 (-2.58)	-0.462 (-2.74)	-0.460 (-2.75)	-0.455 (-2.73)	-0.489 (-2.90)	-0.412 (-2.38)
Youth Access Index		-0.010 (-0.72)								
Minimum Purchase Age			-0.016 (-1.70)							-0.009 (-0.92)
School Restriction				-0.087 (-1.25)						-0.083 (-1.11)
Distribution of Free Samples					-0.059 (-1.53)					-0.077 (-1.68)
Vending Machine Sign						-0.017 (-0.38)				-0.004 (-0.09)
Vending Machine Placement							0.017 (0.39)			0.026 (0.52)
Minimum Age Sign								-0.025 (-0.52)		0.012 (0.22)
Vendor Penalty									0.116 (1.70)	0.138 (1.90)
Male	-0.016 (-0.46)	-0.016 (-0.46)	-0.017 (-0.47)	-0.017 (-0.47)	-0.016 (-0.45)	-0.017 (-0.47)	-0.017 (-0.47)	-0.016 (-0.46)	-0.015 (-0.43)	-0.015 (-0.43)
Age	0.398 (3.73)	0.412 (3.73)	0.396 (3.71)	0.396 (3.70)	0.415 (3.81)	0.403 (3.72)	0.393 (3.67)	0.407 (3.71)	0.380 (3.58)	0.386 (3.52)
Age Squared	-0.011 (-3.43)	-0.012 (-3.44)	-0.011 (-3.41)	-0.011 (-3.41)	-0.012 (-3.53)	-0.012 (-3.42)	-0.011 (-3.36)	-0.012 (-3.41)	-0.011 (-3.26)	-0.011 (-3.20)
African American	-0.690 (-10.98)	-0.690 (-11.00)	-0.693 (-11.01)	-0.698 (-11.06)	-0.691 (-10.99)	-0.689 (-10.93)	-0.690 (-10.99)	-0.689 (-10.97)	-0.687 (-10.93)	-0.696 (-10.96)
Mexican	-0.377 (-4.67)	-0.378 (-4.67)	-0.380 (-4.69)	-0.377 (-4.66)	-0.383 (-4.73)	-0.377 (-4.66)	-0.376 (-4.66)	-0.375 (-4.64)	-0.375 (-4.64)	-0.383 (-4.70)
Cuban	0.100 (0.46)	0.105 (0.48)	0.098 (0.45)	0.127 (0.58)	0.101 (0.46)	0.099 (0.45)	0.099 (0.45)	0.104 (0.48)	0.099 (0.46)	0.122 (0.55)

Puerto Rican	0.062	0.063	0.063	0.065	0.066	0.061	0.061	0.063	0.068	0.075
	(0.36)	(0.36)	(0.37)	(0.38)	(0.38)	(0.35)	(0.36)	(0.37)	(0.40)	(0.43)
Other Latin	-0.325	-0.324	-0.329	-0.318	-0.327	-0.325	-0.325	-0.324	-0.325	-0.325
	(-1.89)	(-1.89)	(-1.91)	(-1.85)	(-1.90)	(-1.89)	(-1.89)	(-1.89)	(-1.89)	(-1.89)
Asian American	-0.441	-0.441	-0.445	-0.441	-0.442	-0.441	-0.441	-0.441	-0.442	-0.443
	(-2.97)	(-2.97)	(-3.00)	(-2.97)	(-2.97)	(-2.97)	(-2.97)	(-2.97)	(-2.97)	(-2.99)
Other Race	-0.065	-0.065	-0.064	-0.065	-0.065	-0.066	-0.065	-0.065	-0.065	-0.065
	(-1.23)	(-1.24)	(-1.22)	(-1.24)	(-1.23)	(-1.25)	(-1.24)	(-1.24)	(-1.24)	(-1.24)
Live With Parents	-0.279	-0.279	-0.281	-0.280	-0.280	-0.278	-0.279	-0.279	-0.277	-0.279
	(-4.73)	(-4.74)	(-4.76)	(-4.74)	(-4.75)	(-4.72)	(-4.72)	(-4.73)	(-4.70)	(-4.73)
Live Alone	-0.145	-0.143	-0.145	-0.143	-0.139	-0.145	-0.145	-0.144	-0.149	-0.139
	(-0.75)	(-0.74)	(-0.75)	(-0.74)	(-0.72)	(-0.75)	(-0.75)	(-0.74)	(-0.77)	(-0.72)
Father Some High School	-0.020	-0.020	-0.016	-0.023	-0.016	-0.020	-0.020	-0.020	-0.020	-0.017
	(-0.19)	(-0.19)	(-0.15)	(-0.21)	(-0.16)	(-0.19)	(-0.19)	(-0.19)	(-0.19)	(-0.16)
Father High School Graduate	-0.049	-0.049	-0.046	-0.050	-0.046	-0.049	-0.049	-0.049	-0.051	-0.047
	(-0.47)	(-0.47)	(-0.44)	(-0.48)	(-0.44)	(-0.48)	(-0.47)	(-0.47)	(-0.49)	(-0.45)
Father Some College	-0.028	-0.028	-0.024	-0.029	-0.026	-0.029	-0.028	-0.028	-0.029	-0.027
	(-0.25)	(-0.25)	(-0.22)	(-0.26)	(-0.23)	(-0.26)	(-0.25)	(-0.25)	(-0.26)	(-0.24)
Father College Graduate	-0.117	-0.116	-0.112	-0.118	-0.116	-0.117	-0.117	-0.117	-0.120	-0.119
	(-1.08)	(-1.07)	(-1.03)	(-1.09)	(-1.07)	(-1.08)	(-1.08)	(-1.08)	(-1.11)	(-1.09)
Father Professional	-0.050	-0.050	-0.047	-0.052	-0.049	-0.050	-0.050	-0.050	-0.051	-0.049
	(-0.42)	(-0.42)	(-0.39)	(-0.44)	(-0.41)	(-0.42)	(-0.42)	(-0.42)	(-0.43)	(-0.41)
Father Education Unknown	0.052	0.052	0.055	0.050	0.055	0.052	0.052	0.051	0.050	0.054
	(0.47)	(0.47)	(0.50)	(0.45)	(0.49)	(0.47)	(0.47)	(0.47)	(0.46)	(0.49)
Mother Some High School	0.016	0.014	0.018	0.017	0.012	0.016	0.017	0.015	0.017	0.015
	(0.14)	(0.12)	(0.15)	(0.15)	(0.10)	(0.14)	(0.15)	(0.13)	(0.15)	(0.13)
Mother High School Graduate	-0.055	-0.056	-0.055	-0.054	-0.057	-0.055	-0.055	-0.056	-0.056	-0.056
	(-0.47)	(-0.48)	(-0.47)	(-0.47)	(-0.49)	(-0.47)	(-0.47)	(-0.48)	(-0.48)	(-0.48)
Mother Some College	-0.104	-0.105	-0.101	-0.102	-0.106	-0.104	-0.103	-0.104	-0.103	-0.101
	(-0.85)	(-0.86)	(-0.83)	(-0.84)	(-0.87)	(-0.85)	(-0.84)	(-0.86)	(-0.85)	(-0.83)
Mother College Graduate	-0.192	-0.193	-0.192	-0.191	-0.195	-0.192	-0.191	-0.192	-0.192	-0.194
	(-1.55)	(-1.56)	(-1.55)	(-1.54)	(-1.57)	(-1.55)	(-1.54)	(-1.55)	(-1.55)	(-1.57)
Mother Professional	-0.146	-0.146	-0.146	-0.143	-0.147	-0.146	-0.145	-0.146	-0.146	-0.145
	(-1.09)	(-1.09)	(-1.09)	(-1.07)	(-1.10)	(-1.09)	(-1.09)	(-1.09)	(-1.09)	(-1.08)

Mother Education Unknown	-0.102 (-0.79)	-0.102 (-0.80)	-0.102 (-0.79)	-0.099 (-0.77)	-0.104 (-0.81)	-0.102 (-0.79)	-0.101 (-0.79)	-0.102 (-0.79)	-0.102 (-0.80)	-0.103 (-0.80)
Mother Occasionally Worked	-0.107 (-1.93)	-0.108 (-1.94)	-0.108 (-1.94)	-0.107 (-1.93)	-0.109 (-1.97)	-0.107 (-1.93)	-0.107 (-1.93)	-0.107 (-1.94)	-0.107 (-1.93)	-0.110 (-1.98)
Mother Usually Worked	0.050 (1.18)	0.050 (1.18)	0.049 (1.16)	0.051 (1.19)	0.048 (1.13)	0.050 (1.19)	0.050 (1.18)	0.050 (1.17)	0.049 (1.16)	0.047 (1.10)
Infrequent Religious Attendance	-0.159 (-3.32)	-0.159 (-3.31)	-0.159 (-3.32)	-0.159 (-3.32)	-0.158 (-3.29)	-0.159 (-3.32)	-0.160 (-3.33)	-0.159 (-3.32)	-0.160 (-3.35)	-0.159 (-3.32)
Moderate Religious Attendance	-0.349 (-5.88)	-0.349 (-5.88)	-0.349 (-5.89)	-0.350 (-5.90)	-0.347 (-5.86)	-0.349 (-5.88)	-0.349 (-5.88)	-0.349 (-5.89)	-0.348 (-5.87)	-0.347 (-5.84)
Frequent Religious Attendance	-0.553 (-10.56)	-0.554 (-10.57)	-0.554 (-10.58)	-0.555 (-10.59)	-0.553 (-10.56)	-0.553 (-10.57)	-0.553 (-10.56)	-0.553 (-10.57)	-0.553 (-10.55)	-0.554 (-10.57)
Engaged	0.574 (3.07)	0.574 (3.07)	0.574 (3.07)	0.573 (3.07)	0.577 (3.09)	0.574 (3.07)	0.575 (3.07)	0.574 (3.07)	0.576 (3.08)	0.579 (3.10)
Separated/Divorced	0.811 (3.06)	0.808 (3.05)	0.810 (3.06)	0.811 (3.06)	0.815 (3.08)	0.809 (3.05)	0.812 (3.06)	0.808 (3.05)	0.818 (3.09)	0.827 (3.11)
Single	0.443 (2.59)	0.441 (2.58)	0.445 (2.60)	0.441 (2.58)	0.444 (2.60)	0.443 (2.59)	0.445 (2.60)	0.442 (2.58)	0.445 (2.60)	0.446 (2.61)
Number of Children	-0.112 (-1.05)	-0.111 (-1.05)	-0.112 (-1.05)	-0.114 (-1.07)	-0.112 (-1.05)	-0.112 (-1.05)	-0.112 (-1.06)	-0.111 (-1.05)	-0.114 (-1.07)	-0.117 (-1.11)
Hours Worked	0.004 (1.85)	0.004 (1.86)	0.004 (1.85)	0.004 (1.87)	0.004 (1.84)	0.004 (1.85)	0.004 (1.85)	0.004 (1.85)	0.004 (1.85)	0.004 (1.85)
Formal School Years	-0.243 (-8.86)	-0.242 (-8.79)	-0.244 (-8.87)	-0.242 (-8.82)	-0.241 (-8.80)	-0.243 (-8.85)	-0.244 (-8.86)	-0.242 (-8.80)	-0.246 (-8.93)	-0.244 (-8.88)
Real Income	0.075 (1.61)	0.075 (1.60)	0.075 (1.61)	0.074 (1.59)	0.074 (1.59)	0.075 (1.61)	0.075 (1.62)	0.075 (1.61)	0.075 (1.59)	0.073 (1.55)
Year	-2.615 (-2.38)	-2.375 (-2.10)	-2.354 (-2.12)	-2.488 (-2.26)	-2.237 (-2.01)	-2.556 (-2.31)	-2.707 (-2.41)	-2.500 (-2.25)	-2.753 (-2.51)	-2.199 (-1.93)
Year Squared	0.014 (2.39)	0.013 (2.11)	0.013 (2.14)	0.013 (2.27)	0.012 (2.02)	0.014 (2.32)	0.014 (2.42)	0.013 (2.26)	0.015 (2.52)	0.012 (1.94)
nobs	-0.115 (-5.45)	-0.115 (-5.46)	-0.115 (-5.45)	-0.116 (-5.49)	-0.115 (-5.45)	-0.115 (-5.45)	-0.114 (-5.44)	-0.115 (-5.46)	-0.113 (-5.39)	-0.114 (-5.40)
New England	-0.026 (-0.27)	-0.024 (-0.25)	-0.031 (-0.32)	-0.028 (-0.29)	-0.023 (-0.24)	-0.028 (-0.30)	-0.031 (0.32)	-0.027 (-0.28)	-0.032 (-0.33)	-0.042 (-0.43)

New Jersey/New York	-0.032 (-0.39)	-0.027 (-0.32)	-0.038 (-0.46)	-0.036 (-0.43)	-0.015 (-0.18)	-0.040 (-0.47)	-0.039 (-0.46)	-0.032 (-0.39)	-0.076 (-0.88)	-0.082 (-0.91)
East	0.078 (0.99)	0.067 (0.84)	0.095 (1.20)	0.086 (1.09)	0.089 (1.14)	0.069 (0.86)	0.079 (1.01)	0.060 (0.70)	0.079 (1.00)	0.120 (1.34)
Southeast	-0.101 (-1.41)	-0.109 (-1.50)	-0.096 (-1.34)	-0.140 (-1.77)	-0.087 (-1.19)	-0.114 (-1.45)	-0.106 (-1.45)	-0.106 (-1.47)	-0.113 (-1.56)	-0.137 (-1.52)
Midwest	-0.027 (-0.39)	-0.022 (-0.32)	-0.026 (-0.38)	-0.022 (-0.32)	-0.007 (-0.10)	-0.034 (-0.48)	-0.036 (-0.50)	-0.028 (-0.42)	-0.027 (-0.39)	-0.011 (-0.14)
Mountain	-0.111 (-1.11)	-0.106 (-1.06)	-0.108 (-1.08)	-0.122 (-1.22)	-0.109 (-1.09)	-0.112 (-1.12)	-0.122 (-1.17)	-0.113 (-1.13)	-0.110 (-1.11)	-0.134 (-1.25)
Plains	-0.128 (-1.50)	-0.128 (-1.50)	-0.159 (-1.81)	-0.128 (-1.50)	-0.096 (-1.09)	-0.135 (-1.54)	-0.130 (-1.52)	-0.136 (-1.56)	-0.145 (-1.69)	-0.128 (-1.32)
Northwest	-0.076 (-0.61)	-0.078 (-0.63)	-0.081 (-0.66)	-0.080 (-0.65)	-0.056 (-0.45)	-0.089 (-0.70)	-0.084 (-0.66)	-0.080 (-0.65)	-0.078 (-0.63)	-0.076 (-0.57)
West	-0.176 (-2.37)	-0.184 (-2.45)	-0.179 (-2.40)	-0.177 (-2.39)	-0.155 (-2.03)	-0.190 (-2.32)	-0.176 (-2.38)	-0.182 (-2.43)	-0.169 (-2.27)	-0.144 (-1.66)

All equations also include an intercept, year, year squared, eight dichotomous region indicators, number of observations per individual in the full sample, and missing value indicators for gender, race/ethnicity, type of community, father's education, mother's education, mothers work status, religious participation, marital status, children, hours worked, school years, and income. Asymptotic t-ratios are in parentheses. The critical values for the t-ratios are 2.58 (2.33), 1.96 (1.64), 1.64 (1.28) at the 1, 5, and 10% significance levels, respectively, based on a two-tailed (one-tailed) test.

Table 4

Smoking Initiation Equations – At Least ½ Pack of Cigarettes Smoked in the Previous 30 Days

Independent Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Real Cigarette Price	-0.595 (-2.81)	-0.609 (-2.87)	-0.562 (-2.64)	-0.571 (-2.65)	-0.598 (-2.81)	-0.577 (-2.69)	-0.599 (-2.83)	-0.600 (-2.82)	-0.610 (-2.86)	-0.546 (-2.46)
Youth Access Index		0.014 (0.78)								
Minimum Purchase Age			-0.019 (-1.62)							-0.018 (-1.42)
School Restriction				-0.049 (-0.57)						-0.043 (-0.46)
Distribution of Free Samples					0.007 (0.15)					-0.014 (-0.25)
Vending Machine Sign						0.053 (0.95)				0.038 (0.63)
Vending Machine Placement							0.022 (0.40)			0.008 (0.12)
Minimum Age Sign								0.069 (1.14)		0.072 (1.06)
Vendor Penalty									0.056 (0.64)	0.052 (0.55)
Male	0.107 (2.33)	0.106 (2.32)	0.106 (2.32)	0.107 (2.34)	0.106 (2.33)	0.107 (2.35)	0.106 (2.33)	0.106 (2.32)	0.107 (2.34)	0.106 (2.32)
Age	0.610 (3.93)	0.589 (3.74)	0.609 (3.93)	0.609 (3.92)	0.607 (3.88)	0.595 (3.83)	0.602 (3.86)	0.583 (3.75)	0.601 (3.86)	0.563 (3.63)
Age Squared	-0.018 (-3.66)	-0.017 (-3.44)	-0.018 (-3.66)	-0.018 (-3.65)	-0.018 (-3.60)	-0.017 (-3.53)	-0.017 (-3.58)	-0.017 (-3.43)	-0.017 (-3.59)	-0.016 (-3.29)
African American	-0.753 (-8.49)	-0.752 (-8.49)	-0.756 (-8.50)	-0.758 (-8.47)	-0.753 (-8.48)	-0.758 (-8.51)	-0.752 (-8.49)	-0.755 (-8.52)	-0.751 (-8.47)	-0.766 (-8.51)
Mexican	-0.451 (-4.12)	-0.450 (-4.12)	-0.454 (-4.14)	-0.451 (-4.12)	-0.450 (-4.11)	-0.453 (-4.14)	-0.450 (-4.11)	-0.457 (-4.19)	-0.450 (-4.11)	-0.461 (-4.20)
Cuban	-0.280 (-0.93)	-0.287 (-0.95)	-0.282 (-0.93)	-0.262 (-0.86)	-0.280 (-0.93)	-0.278 (-0.92)	-0.280 (-0.92)	-0.295 (-0.98)	-0.280 (-0.92)	-0.280 (-0.92)

Puerto Rican	-0.041	-0.042	-0.040	-0.039	-0.042	-0.035	-0.043	-0.044	-0.038	-0.034
	(-0.18)	(-0.19)	(-0.18)	(-0.18)	(-0.19)	(-0.16)	(-0.19)	(-0.20)	(-0.17)	(-0.15)
Other Latin	-0.959	-0.960	-0.966	-0.956	-0.959	-0.958	-0.961	-0.962	-0.957	-0.963
	(-2.57)	(-2.57)	(-2.57)	(-2.56)	(-2.57)	(-2.56)	(-2.57)	(-2.58)	(-2.56)	(-2.57)
Asian American	-0.365	-0.366	-0.371	-0.365	-0.365	-0.368	-0.365	-0.367	-0.365	-0.373
	(-1.87)	(-1.87)	(-1.89)	(-1.87)	(-1.87)	(-1.87)	(-1.87)	(-1.88)	(-1.86)	(-1.91)
Other Race	-0.102	-0.101	-0.102	-0.103	-0.102	-0.100	-0.102	-0.101	-0.102	-0.099
	(-1.55)	(-1.53)	(-1.55)	(-1.56)	(-1.55)	(-1.52)	(-1.55)	(-1.52)	(-1.55)	(-1.50)
Live With Parents	-0.156	-0.156	-0.159	-0.157	-0.156	-0.159	-0.156	-0.156	-0.155	-0.160
	(-2.09)	(-2.09)	(-2.12)	(-2.10)	(-2.09)	(-2.13)	(-2.08)	(-2.09)	(-2.08)	(-2.14)
Live Alone	0.049	0.046	0.050	0.051	0.048	0.049	0.049	0.046	0.047	0.048
	(0.23)	(0.21)	(0.23)	(0.24)	(0.22)	(0.23)	(0.23)	(0.21)	(0.22)	(0.22)
Father Some High School	0.030	0.030	0.033	0.028	0.030	0.032	0.030	0.031	0.030	0.034
	(0.24)	(0.24)	(0.26)	(0.22)	(0.23)	(0.25)	(0.24)	(0.24)	(0.23)	(0.27)
Father High School Graduate	-0.149	-0.149	-0.147	-0.150	-0.149	-0.147	-0.148	-0.147	-0.150	-0.146
	(-1.16)	(-1.17)	(-1.15)	(-1.17)	(-1.17)	(-1.15)	(-1.16)	(-1.15)	(-1.17)	(-1.14)
Father Some College	-0.114	-0.113	-0.111	-0.115	-0.114	-0.110	-0.114	-0.114	-0.114	-0.110
	(-0.81)	(-0.81)	(-0.79)	(-0.82)	(-0.81)	(-0.79)	(-0.81)	(-0.81)	(-0.82)	(-0.79)
Father College Graduate	-0.207	-0.207	-0.204	-0.208	-0.207	-0.206	-0.207	-0.206	-0.209	-0.205
	(-1.53)	(-1.53)	(-1.50)	(-1.54)	(-1.53)	(-1.52)	(-1.53)	(-1.52)	(-1.55)	(-1.51)
Father Professional	-0.276	-0.277	-0.273	-0.278	-0.277	-0.276	-0.276	-0.278	-0.277	-0.277
	(-1.78)	(-1.78)	(-1.76)	(-1.79)	(-1.78)	(-1.78)	(-1.78)	(-1.79)	(-1.78)	(-1.78)
Father Education Unknown	0.055	0.056	0.057	0.053	0.054	0.056	0.055	0.057	0.054	0.059
	(0.40)	(0.40)	(0.41)	(0.39)	(0.40)	(0.41)	(0.40)	(0.41)	(0.39)	(0.43)
Mother Some High School	0.044	0.047	0.046	0.044	0.045	0.044	0.045	0.046	0.044	0.047
	(0.29)	(0.30)	(0.30)	(0.29)	(0.29)	(0.29)	(0.30)	(0.30)	(0.29)	(0.31)
Mother High School Graduate	0.071	0.072	0.071	0.071	0.071	0.070	0.072	0.072	0.071	0.071
	(0.45)	(0.46)	(0.45)	(0.45)	(0.45)	(0.44)	(0.46)	(0.45)	(0.45)	(0.45)
Mother Some College	-0.037	-0.036	-0.034	-0.037	-0.037	-0.038	-0.036	-0.037	-0.037	-0.034
	(-0.23)	(-0.22)	(-0.21)	(-0.22)	(-0.22)	(-0.23)	(-0.22)	(-0.22)	(-0.23)	(-0.20)
Mother College Graduate	-0.042	-0.040	-0.043	-0.042	-0.041	-0.043	-0.040	-0.042	-0.042	-0.044
	(-0.25)	(-0.24)	(-0.25)	(-0.25)	(-0.24)	(-0.25)	(-0.24)	(-0.25)	(-0.25)	(-0.26)
Mother Professional	-0.123	-0.123	-0.123	-0.122	-0.123	-0.122	-0.123	-0.122	-0.124	-0.120
	(-0.66)	(-0.65)	(-0.65)	(-0.65)	(-0.66)	(-0.65)	(-0.65)	(-0.65)	(-0.66)	(-0.64)
Mother Education Unknown	-0.026	-0.025	-0.026	-0.025	-0.026	-0.026	-0.025	-0.027	-0.027	-0.027
	(-0.15)	(-0.15)	(-0.15)	(-0.14)	(-0.15)	(-0.15)	(-0.15)	(-0.16)	(-0.16)	(-0.16)

Mother Occasionally Worked	-0.126 (-1.81)	-0.125 (-1.79)	-0.127 (-1.82)	-0.126 (-1.81)	-0.126 (-1.80)	-0.125 (-1.79)	-0.126 (-1.80)	-0.125 (-1.79)	-0.126 (-1.81)	-0.126 (-1.80)
Mother Usually Worked	-0.004 (-0.08)	-0.004 (-0.08)	-0.005 (-0.09)	-0.004 (-0.07)	-0.004 (-0.08)	-0.005 (-0.10)	-0.005 (-0.08)	-0.003 (-0.06)	-0.005 (-0.09)	-0.005 (-0.09)
Infrequent Religious Attendance	-0.222 (-3.96)	-0.223 (-3.98)	-0.221 (-3.96)	-0.222 (-3.96)	-0.222 (-3.97)	-0.222 (-3.96)	-0.222 (-3.97)	-0.222 (-3.97)	-0.222 (-3.97)	-0.222 (-3.97)
Moderate Religious Attendance	-0.443 (-6.03)	-0.444 (-6.04)	-0.444 (-6.03)	-0.444 (-6.03)	-0.444 (-6.04)	-0.443 (-6.03)	-0.443 (-6.03)	-0.443 (-6.03)	-0.443 (-6.03)	-0.443 (-6.01)
Frequent Religious Attendance	-0.732 (-10.98)	-0.732 (-10.97)	-0.734 (-10.98)	-0.733 (-10.98)	-0.732 (-10.98)	-0.731 (-10.96)	-0.732 (-10.98)	-0.732 (-10.97)	-0.732 (-10.98)	-0.733 (-10.96)
Engaged	0.509 (2.32)	0.509 (2.32)	0.508 (2.32)	0.508 (2.32)	0.508 (2.32)	0.511 (2.33)	0.508 (2.32)	0.510 (2.32)	0.508 (2.32)	0.510 (2.32)
Separated/Divorced	0.715 (2.35)	0.717 (2.35)	0.714 (2.34)	0.715 (2.35)	0.714 (2.35)	0.721 (2.37)	0.716 (2.35)	0.721 (2.36)	0.718 (2.35)	0.729 (2.39)
Single	0.292 (1.44)	0.294 (1.44)	0.292 (1.44)	0.290 (1.43)	0.291 (1.43)	0.294 (1.45)	0.293 (1.44)	0.295 (1.45)	0.291 (1.43)	0.297 (1.46)
Number of Children	0.016 (0.14)	0.015 (0.13)	0.017 (0.15)	0.015 (0.13)	0.016 (0.14)	0.016 (0.13)	0.015 (0.13)	0.015 (0.13)	0.015 (0.13)	0.013 (0.11)
Hours Worked	0.004 (1.32)	0.004 (1.32)	0.004 (1.32)	0.004 (1.33)	0.004 (1.33)	0.004 (1.31)	0.004 (1.32)	0.004 (1.32)	0.004 (1.32)	0.004 (1.32)
Formal School Years	-0.188 (-5.73)	-0.190 (-5.76)	-0.188 (-5.74)	-0.187 (-5.72)	-0.188 (-5.73)	-0.188 (-5.75)	-0.188 (-5.73)	-0.191 (-5.81)	-0.188 (-5.74)	-0.192 (-5.82)
Real Income	0.110 (2.00)	0.111 (2.01)	0.111 (2.00)	0.110 (1.99)	0.111 (2.00)	0.110 (1.99)	0.111 (2.00)	0.111 (2.01)	0.110 (1.98)	0.110 (1.98)
Year	-3.619 (-2.65)	-3.923 (-2.81)	-3.330 (-2.42)	-3.548 (-2.59)	-3.664 (-2.66)	-3.802 (-2.78)	-3.727 (-2.67)	-3.933 (-2.87)	-3.667 (-2.69)	-3.741 (-2.66)
Year Squared	0.019 (2.63)	0.021 (2.79)	0.018 (2.40)	0.019 (2.57)	0.019 (2.64)	0.020 (2.75)	0.020 (2.65)	0.021 (2.85)	0.019 (2.66)	0.020 (2.65)
nobs	-0.132 (-4.99)	-0.132 (-4.98)	-0.132 (-4.98)	-0.133 (-5.01)	-0.132 (-5.00)	-0.133 (-5.02)	-0.132 (-4.98)	-0.132 (-4.99)	-0.131 (-4.97)	-0.132 (-4.98)
New England	0.026 (0.22)	0.023 (0.19)	0.022 (0.18)	0.026 (0.21)	0.026 (0.22)	0.032 (0.27)	0.020 (0.17)	0.027 (0.23)	0.024 (0.20)	0.021 (0.18)
New Jersey/New York	-0.115 (-1.04)	-0.123 (-1.11)	-0.122 (-1.10)	-0.117 (-1.06)	-0.117 (-1.05)	-0.090 (-0.79)	-0.124 (-1.10)	-0.115 (-1.03)	-0.138 (-1.21)	-0.125 (-1.05)
East	0.106 (1.05)	0.121 (1.17)	0.126 (1.23)	0.110 (1.09)	0.105 (1.03)	0.132 (1.27)	0.108 (1.07)	0.155 (1.41)	0.106 (1.05)	0.202 (1.76)

Southeast	-0.025 (-0.27)	-0.014 (-0.15)	-0.020 (-0.21)	-0.047 (-0.46)	-0.027 (-0.28)	0.013 (0.13)	-0.031 (-0.32)	-0.012 (-0.13)	-0.030 (-0.33)	-0.002 (-0.01)
Midwest	-0.012 (-0.13)	-0.018 (-0.20)	-0.011 (-0.12)	-0.009 (-0.10)	-0.014 (-0.16)	0.009 (0.09)	-0.023 (-0.25)	-0.008 (-0.09)	-0.012 (-0.13)	0.012 (0.12)
Mountain	-0.249 (-1.93)	-0.255 (-1.98)	-0.245 (-1.90)	-0.256 (-1.98)	-0.249 (-1.93)	-0.246 (-1.91)	-0.264 (-1.99)	-0.245 (-1.90)	-0.249 (-1.93)	-0.250 (-1.84)
Plains	-0.193 (-1.71)	-0.192 (-1.70)	-0.229 (-1.95)	-0.193 (-1.71)	-0.196 (-1.71)	-0.173 (-1.50)	-0.195 (-1.72)	-0.172 (-1.50)	-0.200 (-1.77)	-0.192 (-1.50)
Northwest	0.057 (0.36)	0.060 (0.38)	0.051 (0.32)	0.054 (0.34)	0.054 (0.34)	0.100 (0.62)	0.046 (0.28)	0.069 (0.44)	0.055 (0.35)	0.092 (0.55)
West	-0.183 (-1.83)	-0.172 (-1.70)	-0.186 (-1.85)	-0.184 (-1.83)	-0.186 (-1.83)	-0.140 (-1.28)	-0.184 (-1.84)	-0.166 (-1.65)	-0.180 (-1.79)	-0.129 (-1.12)

All equations also include an intercept, year, year squared, eight dichotomous region indicators, number of observations per individual in the full sample, and missing value indicators for gender, race/ethnicity, type of community, father's education, mother's education, mothers work status, religious participation, marital status, children, hours worked, school years, and income. Asymptotic t-ratios are in parentheses. The critical values for the t-ratios are 2.58 (2.33), 1.96 (1.64), 1.64 (1.28) at the 1, 5, and 10% significance levels, respectively, based on a two-tailed (one-tailed) test.

Table 5

Estimated Price Elasticities of Initiation (no state fixed effects included)

	Any Smoking	At least 1-5 cigarettes per day on Average	At least ½ pack per day on average
Model 1	-0.294	-0.832 [a]	-0.988 [a]
Model 2	-0.283	-0.809 [a]	-1.010 [a]
Model 3	-0.221	-0.776 [a]	-0.932 [a]
Model 4	-0.225	-0.751 [a]	-0.948 [a]
Model 5	-0.280	-0.788 [a]	-0.992 [a]
Model 6	-0.288	-0.842 [a]	-0.957 [a]
Model 7	-0.300 [b]	-0.839 [a]	-0.995 [a]
Model 8	-0.291	-0.829 [a]	-0.994 [a]
Model 9	-0.340 [b]	-0.890 [a]	-1.013 [a]
Model 10	-0.191	-0.750 [a]	-0.721 [a]
Average	-0.271	-0.811 [a]	-0.955 [a]

[a] Significant at the 1% level
[b] Significant at the 10% level

Table 6

Estimated Price Elasticities of Initiation (state fixed effects included)

	Any Smoking	At least 1-5 cigarettes per day on Average	At least ½ pack per day on average
Model 1	-0.117 [b]	-1.29 [a]	1.45 [a]
Model 2	-0.118 [b]	-1.28 [a]	1.45 [a]
Model 3	-0.102 [b]	-1.25 [a]	1.42 [a]
Model 4	-0.118 [b]	-1.30 [a]	1.46 [a]
Model 5	-0.113 [b]	-1.18 [a]	1.41 [a]
Model 6	-0.119 [b]	-1.29 [a]	1.49 [a]
Model 7	-0.113 [b]	-1.28 [a]	1.45 [a]
Model 8	-0.119 [b]	-1.29 [a]	1.45 [a]
Model 9	-0.104 [b]	-1.19 [a]	1.42 [a]
Model 10	-0.083 [b]	-0.995 [a]	1.34 [a]
Average	-0.111	-1.23 [a]	1.43 [a]

[a] Significant at the 1% level
[b] Significant at the 10% level