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YOUTH ALCOHOL USE
AND PUBLIC POLICY

Adit Laixuthai

Frank J. Chaloupka

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ABSTRACT

This paper examines the frequency of youth drinking and heavy drinking in 1982 and 1989. The effects of minimum legal drinking ages and beer excise taxes are considered separately for each year. In both years, drinking is found to be responsive to changes in prices resulting from higher excise taxes. However, the price sensitivity of youth alcohol use fell after the change to a uniform legal drinking age of 21.

Adit Laixuthai
Health Resources Management (M/C 923)
School of Public Health East
University of Illinois at Chicago
Box 6998
Chicago, IL 60680

Frank J. Chaloupka
Department of Economics
University of Illinois at Chicago
601 South Morgan St.
Chicago, IL 60607-7121
and NBER

I. INTRODUCTION

Between 1970 and 1975, 29 states lowered their minimum legal drinking ages for alcohol to comply with a change in the voting age from 21 to 18 in 1970. In 1976, a growing concern about youth drinking and its consequences reversed this trend. This reversal was accelerated by the Federal Uniform Drinking Age Act of 1984, which threatened to withhold Federal highway funds for if a state failed to raise its minimum legal drinking age to 21 years by October 1, 1986. By 1987, all had complied, though some states kept the effective drinking age below 21 years until 1990 by appending grandfather clauses to the law raising the age.

One way to discourage youth alcohol abuse generally ignored in the antidrinking campaign increasing taxes on alcoholic beverages. January 1991 marked the first increases in federal excise taxes on beer and wine since November 1, 1951. In addition, the federal tax on distilled spirits, increased modestly in 1985, was raised for only the second time since 1951. As a result of the Omnibus Budget Reconciliation Act of 1990, the beer tax doubled to 32 cents per six pack, the wine tax rose from just over 3¢ cents per 750ml to about 21¢, and the spirits tax increased from \$12.50 to \$13.70 per proof gallon. Although the beer and wine tax hikes were substantial, they fell far short of the 25¢ per ounce of ethanol proposed by the Bush administration (these are now approximately 10¢, 7¢, and 21¢ for an ounce of ethanol in beer, wine, and distilled spirits, respectively). Similarly, except for the wine tax increase, the 1991 tax hikes

are well below the increases necessary to offset the effects of inflation since 1951. Finally, while Congress may have been persuaded by the health promotion aspects of higher alcohol taxes (Cook and Moore, 1991), the increases were well below those recommended by numerous public health groups.

Numerous studies by economists find that increases in minimum drinking ages reduce youth alcohol consumption, heavy alcohol consumption, various alcohol related problems, and vehicle collisions.¹ O'Malley and Wagenaar (1991), using self-reported data from the Monitoring the Future (MTF) project, find that higher drinking ages contributed to a reduction in alcohol consumption by high school seniors. Similarly, Grossman and his colleagues (Grossman, Coate, and Arluck, 1987; Coate and Grossman, 1988), using the First and Second National Health and Nutrition Examination Surveys, find that increased drinking ages significantly reduce the frequency of youth alcohol consumption. Moreover, they find that frequent and fairly frequent consumption fall more in absolute or percentage terms than the fraction of infrequent drinkers as the drinking age rises. Likewise, using a time-series of state cross-sections, Saffer and Grossman (1987) find that higher minimum legal drinking ages significantly reduce youth motor vehicle accident fatalities. Finally, Cook and Moore (1992) find that states with higher drinking ages increase the probability of educational success.

Similarly, there are a number of studies of the price responsiveness of youth alcohol consumption and related outcomes.

Grossman and his colleagues find that the frequency of youth alcohol consumption is sensitive to alcoholic beverage prices. Their findings indicate larger reductions in the fractions of youth frequent and fairly frequent drinkers in response to a tax increase than in the fraction of infrequent drinkers. As they note, this finding should not be understated since these are the drinkers most likely to be responsible for motor vehicle crashes and deaths. This is confirmed by Saffer and Grossman's examination of youth motor vehicle accident fatalities.

Although the minimum legal drinking age is uniformly 21 now, some questions on its effectiveness. This paper examines the frequency of youth alcohol use and heavy drinking by youths using the 1982 and 1989 Monitoring the Future surveys to i) investigate the effects of minimum legal drinking ages and alcoholic beverage prices on youth drinking, and ii) investigate the effects of a uniform age of 21 on the price sensitivity of youth alcohol use.

II. DATA AND EMPIRICAL FRAMEWORK

Youth alcohol demand equations are estimated using data on the frequency of youth alcohol consumption taken from the 1982 and 1989 Monitoring the Future surveys. These data are obtained using multi-clustered sampling procedures designed to produce a nationally representative sample of between 15,000 and 19,000 high school seniors. The annual surveys are conducted by the Institute for Social Research at the University of Michigan and are described in detail by Johnston, et al., (1987).

The surveys focus on the use of illegal drugs, alcohol, and

cigarettes and, consequently, great care is taken to ensure that the information collected is informative. The data are collected directly from students. Parents are not present during interviews and are not informed about their child's responses. Polich (1982) concludes that self-reported data on alcohol consumption are generally valid. Furthermore, he notes that it is unlikely that there will be significant underreporting when broadly based outcome measures, such as those used below, are employed.

By special agreement, a restricted data set containing the variables reflecting youth alcohol consumption and identifiers for each youth's county of residence was provided. These data also include a variety of socioeconomic and demographic information was provided.

Since the surveys cover many topics, different questionnaires are administered (five in 1982, six in 1989). About one-third of each form includes the common core variables such as the demographic variables and alcohol use variables employed in this research. None of these variables are beverage specific.² Categorical information on the number of drinking occasions in the last 30 days, the last year, and in the respondent's lifetime, as well as the number of times in the last two weeks that s/he had five or more drinks in one occasion is obtained.

Three alternative measures of youth drinking are constructed from these data. The first two measure the frequency of drinking, rather than actual consumption (which would be the ideal measure). No information is available on average consumption

during each of those occasions. However, average consumption and frequency of drinking are expected to be highly correlated.

The first frequency variable looks at alcohol consumption during the previous year and is measured as follows: abstainers are defined as youths with no drinking occasions; infrequent drinkers are defined as youths with between 1 and 9 drinking occasions; fairly frequent drinkers are defined as youths with 10 to 30 drinking occasions; and frequent drinkers are defined as youths with more than 30 drinking occasions. Frequency of drinking in the past year is defined as 0, 1, 2, and 3 for abstainers, infrequent drinkers, fairly frequent drinkers, and frequent drinkers, respectively.

The second captures drinking in the past 30 days, and is defined as 0 for abstainers (no drinking occasions), 1 for infrequent drinkers (1 to 5 drinking occasions), 2 for fairly frequent drinkers (6 to 9 drinking occasions), and 3 for frequent drinkers (10 or more drinking occasions).

The final drinking variable is an indicator of heavy drinking. This variable addresses the issue of problem drinking more directly. The heavy drinking variable is defined as one if the youth had at least one drinking occasion in the two weeks prior to the survey in which s/he consumed five or more drinks, and is as zero otherwise. These are the drinking occasions which are most likely to have negative consequences and to be of concern to policymakers (i.e., drinking five or more drinks in a single occasion and then driving is expected to significantly raise the

probability of a motor vehicle accident and, potentially, death).

The average combined federal and state excise tax on a case of 24-12 ounce cans of beer in the first two quarters of the survey year is employed as the measure of the price of alcohol.³ The tax variable is deflated with a local cost of living index taken from the American Chamber of Commerce Researchers Association's quarterly reports for between 200 and 300 cities as well as by the national Consumer Price Index. Price is expected to have a negative impact on both the frequency of drinking and the probability of heavy drinking.

The minimum legal drinking age for low alcohol beer is added to the survey data as an additional measure of the full price of alcohol.⁴ While almost all youths surveyed are unable to legally purchase alcoholic beverages in any state, youths residing in states with higher minimum ages will face greater difficulty in obtaining alcoholic beverages than their counterparts in states where the legal age is lower. Thus, the frequency of drinking and the probability of heavy drinking are expected to be inversely related to the drinking age.

In addition to the own-state minimum drinking age, a dichotomous indicator equal to one if the youth resides in a county within 25 miles of a state with a lower legal age is added. This variable is equal to zero if the youth does not live in a county within 25 miles of another state or if the drinking age in the youth's state of residence is as low or lower than that in nearby states. This variable captures potential border crossing by

youths from high age states to nearby lower age states to obtain alcohol.⁵ Hence, both the frequency of drinking and the likelihood of heavy drinking are expected to be positively related to the lower border age indicator.

Several independent variables were constructed from the socioeconomic and demographic information collected in the surveys. These are indicators of sex, race (black and other), religious participation (infrequent and frequent attendance at religious services) and work status (part- and full-time), as well as the youth's age. Real weekly income is created by deflating the youth's nominal weekly income data collected in the survey by the local cost-of-living index and the national CPI.

The original sample sizes were 18,348 for 1982 and 17,142 for 1989. After discarding respondents with missing or inconsistent data (i.e. someone who indicated fewer drinking occasions for the past year than they did for the past month), samples of 13,240 and 12,880 were obtained for 1982 and 1989, respectively.

The dependent variables are both discrete and ordinal. As Greene (1990) indicates, the ordered probit procedure is the appropriate estimation technique for this type of data. Grossman and his colleagues used multinomial logit methods to fit their demand equations which employed similar dependent variables. However, multinomial logit and probit methods are most appropriate where there is no order to the dependent variable. Using multinomial techniques when the dependent variable has some ordering will fail to account for the ordinal nature of the

dependent variable while ordinary least squares would impose greater restrictions on the nature of the ordering (Greene, 1990).⁶ Dichotomous probit methods are used to estimate the heavy drinking equations.

The coefficients from the ordered probit method imply the effects of a variable on the top category (frequent drinkers) and the bottom category (abstainers). For example, a negative price or drinking age coefficient implies that the number of frequent drinkers falls as price rises while the number of abstainers rises. However, the numbers in the middle categories may go up or down. Thus, the net effects on these categories are unclear (i.e., some frequent drinkers consume less frequently or abstain in response to the price increase, increasing the number of fairly frequent and infrequent drinkers, while some fairly frequent and infrequent drinkers consume less frequently and/or abstain). Therefore, the new probability distribution and the percentage change in the probability for each category in response to various policy changes will be calculated in order to interpret the coefficients in these models.

III. RESULTS AND EVALUATION

Ordered probit estimates of the frequency of alcohol consumption in the past year and in the past month are presented in columns 1 and 2 of Table 1. Dichotomous probit estimates for the probability of at least one heavy drinking episode in the past two weeks are presented in column 3. Panel A contains the 1982 sample results, while Panel B presents those for the 1989 sample.

The beer tax is negative and significant at at least the one percent level in each of the three models estimated for the 1982 sample. Similarly, the beer tax is negative, albeit less significant, in the equations estimated using the 1989 sample. In these models, the tax is significant at at least the one percent level in the drinking in the past year equation, but is significant at only the ten percent level when drinking in the past month is the dependent variable. The tax remains negative, but is not significant at conventional levels in the heavy drinking equation. Finally, the coefficient on the beer tax is substantially smaller for the 1989 sample than it is for the 1982 sample. Results for both samples, however, show that increases in beer taxes will significantly reduce the frequency of youth drinking. Furthermore, the results indicate that higher beer taxes would have significantly reduced the probability of a heavy drinking incident in 1982. Finally, higher taxes would also have reduced the probability of heavy drinking in 1989, although this finding is not statistically significant.

Results from both samples indicate that the minimum drinking age negatively affects both the frequency of youth alcohol consumption and the probability of heavy drinking. In all equations, the variable indicating the minimum legal drinking age is negative. These coefficients are statistically significant for the 1982 sample, but are insignificant at conventional levels for the 1989 sample (where there is very little variation drinking ages). The positive and highly significant coefficients on the

dichotomous border age variable in 1982 are evidence of a border phenomenon. That is, underage youth who live within 25 miles of a state with a lower legal drinking age apparently cross the border to obtain alcoholic beverages.

The coefficients for the frequent religious service attendance variable are negative and highly significant in all models, while those on the infrequent participation variable are generally insignificant. This suggests that youths who are strongly attached to a religion drink less frequently and are much less likely to drink heavily than those not as strongly attached. There is no difference in alcohol consumption between youths who do not attend services and those who attend infrequently. Blacks and other races drink much less frequently and are significantly less likely to drink heavily than whites. Similarly, all models indicate that young men drink much more often and are more likely to drink heavily than young women. The relationship between age and the frequency of drinking is unclear. Older high school seniors are found to drink less frequently than their younger counterparts, contrary to expectations, when the dependent variable reflects drinking in the past year. However, for the other two outcomes, there appears to be no relationship between drinking and age. Youths with greater resources, as measured by the youth income variable, drink more often and are more likely to drink heavily than youths with less income, as expected. Similarly, youths who work either part- or full-time are more frequent drinkers and are more likely to have had at least one

heavy drinking incident in the two weeks prior to the survey than unemployed youths. Those employed full-time appear to drink more frequently than those employed part-time, and are more likely to drink heavily. These findings may reflect greater access to alcohol through older co-workers for employed youths.

IV. POLICY SIMULATIONS

As discussed above, it is difficult to interpret the effects of changes in variables of interest on the frequency of drinking directly from the ordered probit coefficients. While the coefficient itself provides some information, the marginal effect of a variable on each of the groups is more useful. Table 2 presents simulation results which use these marginal effects to evaluate the impact of changes in policy on the frequency of youth drinking and the probability of heavy drinking by youths.⁷

Three alternative policies are simulated in the 1982 sample: 1) a uniform drinking age of 21 years, 2) a uniform drinking age of 18 years, and 3) an increase in the federal beer tax to offset the effects of inflation since 1951. In 1982, the average drinking age was 19.8 years. The tax policy simulated implies an increase in the federal tax from 64 cents per case to approximately \$2.37. Only the inflation tax policy is simulated for the 1989 sample (raising the tax to about \$3.05), given the insignificant coefficients on the drinking age and the fact that it is 21 almost everywhere (the mean is 20.97). Finally, in the drinking age simulations, the lower border age indicator is set to zero.

Table 2 presents the actual distributions for the two

samples, the distributions predicted to result from the change in policy (based on the estimates presented in Table 1) and the percentage change in the number of youths in each category which results (in parentheses). Panel A presents these results for the 1982 sample, while Panel B presents those for the 1989 sample.

As shown directly by the ordered probit coefficients from the drinking frequency equations for the 1982 sample, the number of abstainers is positively related to the state minimum legal drinking age, while the number of frequent drinkers is inversely related to the state drinking age. Imposing a uniform drinking age of 21 years would lead to reductions of 8.3 and 9.2 percent in the number of youths who drank frequently in the past year and past month, respectively, while it would increase the comparable number of abstainers by 10.6 and 7.6 percent. Furthermore, the number of fairly frequent drinkers would fall by 2.5 percent in the past year and 5.2 percent in the past month. Finally, the number of infrequent drinkers in the past year rises somewhat (as frequent and fairly frequent drinkers reduce their drinking) to 3.2 percent, while infrequent drinking in the past month is virtually unchanged.

As expected, the opposite would occur if the drinking age was lowered uniformly to 18 years. Now, the number of abstainers would fall, while the numbers of fairly frequent and frequent drinkers would rise substantially.

Finally, as the simulations based on the heavy drinking indicator demonstrate, the likelihood of at least one heavy

drinking incident in the past two weeks is predicted to fall by 4.1 percent when the drinking age is uniformly 21, while it would rise by only 0.4 percent if the legal age was uniformly 18.

The results for 1982 indicate that even larger changes in youth drinking would occur as a result of the substantial increase in the federal excise tax on beer being considered. The approximately four-fold tax increase would cut the number of frequent youth drinkers almost in half. Furthermore, the number of fairly frequent drinkers in the past year would fall by nearly one-fifth, while the number of fairly frequent drinkers in the past month would fall by over one-fourth. Infrequent drinking in the past year would rise modestly, while infrequent drinking in the past month would fall somewhat. Finally, the number of abstainers over the past year would nearly double as a result of the tax increase, while their number in the past month would rise by approximately 40 percent.

Lastly, the substantial tax increase is predicted to sharply lower the likelihood that a youth engages in heavy drinking. As a result of the tax increase, the number of youths with at least one heavy drinking episode in the two weeks prior to the survey is predicted to fall by nearly twenty percent.

The actual distribution of drinking in the 1989 sample, after the change in policy mandating a uniform drinking age of 21, indicates an even greater reduction in the frequency of youth drinking than that predicted based on the results from the 1982 sample. This is likely to be the result of the drinking age

increase combined with a number of other activities occurring over this time period, including a greater number of public service advertisements targeting youths about the consequences of driving drunk, greater education about the consequences of all substance abuse as part of the war on drugs, and increased enforcement of and more severe penalties associated with drunken driving.⁸

Perhaps more surprising is the finding that the now nearly five-fold increase in the federal tax on beer being simulated would have less of an impact on the frequency of youth drinking as well as on heavy drinking by youths than the comparable tax increase in 1982. However, the 1989 tax increase is generally found to have a greater impact on youth drinking than going from a uniform drinking age of 18 to one of 21 (based on the 1982 results). In the 1989 sample, the federal beer tax increase being simulated lowers the number of frequent drinkers in the past year and past month by nearly 20 percent and just over 10 percent, respectively. Similarly, the number of fairly frequent drinkers falls by about 9 percent and by nearly 7 percent for the past year and past month respectively. As in 1982, much of the shift is towards abstention, with the number of non-drinkers in the past year rising by just over 20 percent, while the number of non-drinkers in the past month rises by slightly more than 6 percent. Finally, the number of infrequent drinkers in the past year rises by almost 4 percent as a result of the tax increase, while the number of infrequent drinkers in the past month falls by just under 2 percent.

Similarly, the predicted fall in the number of youths with at least one heavy drinking incident shortly before the survey falls by less in 1989 (6.5 percent) than it does in 1982 (18.4 percent) in response to the tax increase which offsets the impact of inflation since 1951.

V. DISCUSSION

The results presented above are consistent with other econometric examinations of youth drinking in that increased alcoholic beverage prices and/or minimum legal drinking ages reduce the frequency of alcohol consumption and heavy drinking by youths. Furthermore, they are consistent with Grossman and his colleagues' finding that the reductions in drinking are not limited to infrequent drinkers only, but instead that even larger reductions occur in the numbers of youths who drink frequently or fairly frequently. The one surprising finding, however, is that the sensitivity of youth drinking to price falls after the shift in drinking age policy resulting from the federal mandate that states raise their minimum legal ages to 21.

Upon further consideration, this finding may not be that surprising. That is, the "full price" of consuming alcohol for a youth is the sum of both the money price and the indirect costs. The indirect costs of alcohol consumption for underage drinkers include the legal obstacles to consumption such as the higher minimum drinking ages resulting from the Federal Uniform Drinking Age Act of 1984. Other indirect costs include the money and time costs of obtaining a false identification to purchase alcohol,

the time costs of obtaining the alcohol itself, and others. Thus, increases in drinking ages and increases in alcohol taxes both increase the full price of drinking for underage youths. When the average drinking age is relatively low (as in the 1982 sample), a given increase in alcohol taxes will have a larger impact on the full price of alcohol than when the average drinking age is relatively high (as in the 1989 sample). Thus, in 1989, high school seniors face a greater indirect cost of obtaining alcohol than they did in 1982 due to the (almost) uniform drinking age of 21. Hence, the same real increase in the tax has a smaller impact on full price in 1989 and, therefore, should have a smaller impact on the frequency of youth alcohol consumption and on heavy drinking by youths, than in 1982. Nevertheless, the reductions in the frequency of drinking and in heavy drinking resulting from the tax increase in 1989 are generally larger than those associated with raising the drinking age from a uniform level of 18 to a level of 21 in 1982.

This research indicates that increases in the full price of alcoholic beverages, either by raising excise taxes on alcohol or by increasing minimum legal drinking ages will substantially reduce the frequency of drinking and heavy drinking by youths. Furthermore, the results indicate that relatively large tax increases would lead to larger reductions in the frequency of youth alcohol consumption and heavy drinking than increasing the drinking age from 18 to 21 years.

The choice of policy depends on a comparison of the welfare

costs and benefits associated with the two policies. One advantage of the drinking age policy as compared to the tax policy is that excise tax increases impose welfare costs on all drinkers, while drinking ages are targeted at the group in the population which accounts for a disproportionate share of motor vehicle accidents and deaths. There are three factors, however, which go in the opposite direction. First, administrative and enforcement costs associated with a drinking age policy are likely to be much higher than those associated with the tax policy. Second, as emphasized by Kenkel (1992), the loss in consumer surplus from the drinking age policy is not partially offset by the increased revenues associated with a higher tax on alcoholic beverages. Finally, the tax increases will lead to reductions in alcohol consumption and the negative consequences of consumption in all segments of the population (Chaloupka, forthcoming).

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FOOTNOTES

1. See the General Accounting Office's (1987) detailed summary of several of these studies. It's important to keep in mind that overall alcohol consumption is generally not of concern to policymakers. Instead, of primary concern is excessive alcohol consumption and its consequences (including motor vehicle and other accidents, lack of success in school, health problems, etc.).
2. Beverage specific consumption, as well as other alcohol related information, is obtained for a limited sample in one of the form specific sets of questions.
3. Models identical to those presented below were estimated using beer prices and a weighted beer, wine, and distilled spirits price variable constructed from the data in the American Chamber of Commerce Researchers Association's quarterly price reports. The results are similar to those presented below and are available upon request. Beer taxes are chosen rather than wine or spirits taxes since beer is taxed in every state, while the excise taxes on wine and distilled spirits in monopoly states do not provide meaningful information since much of the state's revenues come from markups in state run liquor stores. Finally, beer is generally regarded as the beverage of choice, particularly for youthful drinkers.
4. The minimum legal drinking age is the weighted average of the legal ages in place during the first two quarters of the year in which the youth is surveyed. The construction of this variable accounts for the grandfather clauses many states adopted when

raising their legal ages for all alcoholic beverages to 21 years to comply with the Federal Uniform Drinking Age Act of 1984. While all states had complied with this law by 1987, grandfather clauses in some states kept the effective legal age below 21 years in some states until mid-1989. Similar variables were constructed for high alcohol content beer and for distilled spirits. The choice of the drinking age variable had little impact on the resulting estimates.

5. This variable is zero for all youths in 1989 since grandfather clauses which keep effective drinking ages below 21 apply only to residents, and is omitted from the equations for the 1989 sample.

6. For example, ordinary least squares would impose the restriction that the nature of the ordering is linear. That is, the outcome of fairly frequent drinking, which takes on a value of two, would be treated as twice as much as that of infrequent drinking, which takes on a value of one. This is clearly an incorrect assumption. Ordered probit methods do not impose this type of restriction. That is, the marginal effect of a variable on each of the outcomes depends not only on the coefficient, but also on the different intercepts estimated for each outcome. Using ordered probit techniques, however, does assume that the underlying distribution is normal.

7. Formally (based on Greene, 1990): the underlying model is assumed to be $Y^* = \beta'X + \epsilon$, where Y^* is alcohol consumption, X is a vector containing determinants of consumption, β is a vector of coefficients, and ϵ is an error term. However, Y^* is not observed. What is observed is $Y=0, 1, 2, \text{ and } 3$, when $Y^* \leq 0$, $0 \leq Y^* \leq \mu_1$, $\mu_1 \leq Y^* \leq \mu_2$,

and $\mu_2 \leq Y^*$, respectively. The probabilities of each outcome are:

$$\text{Prob}[Y=0] = 1 - \Phi(\beta'X)$$

$$\text{Prob}[Y=1] = \Phi(\mu_1 - \beta'X) - \Phi(-\beta'X)$$

$$\text{Prob}[Y=2] = \Phi(\mu_2 - \beta'X) - \Phi(\mu_1 - \beta'X)$$

$$\text{Prob}[Y=3] = 1 - \Phi(\mu_2 - \beta'X)$$

where Φ is the cumulative standard normal distribution. Policy simulations were conducted by changing the value of the appropriate independent variable to reflect the policy under consideration and recomputing the probabilities based on the estimated coefficients.

8. Kenkel (forthcoming) finds that the stronger drunken driving laws have much of their impact on consumption.

Table 1
 Youth Alcohol Demand Equations
 Panel A: 1982 Sample

Variable	Drinking in the Past Year	Drinking in the Past Month	Drinking in the Past Two Weeks
Beer Tax	-2162.020 (-9.29)	-1876.34 (-7.75)	-1107.606 (-3.77)
Minimum Legal Drinking Age	-0.025 (-3.08)	-0.031 (-3.69)	-0.015 (-1.53)
Lower Border Age Indicator	0.122 (5.35)	0.107 (4.66)	0.098 (3.60)
Male	0.314 (16.46)	0.281 (14.47)	0.467 (20.27)
Black	-0.483 (-22.44)	-0.668 (-19.03)	-0.837 (-18.17)
Other Race/Ethnicity	-0.483 (-15.04)	-0.381 (-11.56)	-0.358 (-9.11)
Age	-0.067 (-3.53)	-0.162 (-0.84)	-0.002 (-0.09)
Income	28.919 (11.58)	28.765 (11.42)	26.316 (8.79)
Work Less than Half-Time	0.090 (3.51)	0.083 (3.16)	0.036 (1.14)
Work More than Half-Time	0.138 (4.18)	0.107 (3.19)	0.070 (1.74)
Infrequent Religious Participation	0.058 (1.63)	0.071 (1.97)	0.004 (0.09)
Frequent Religious Participation	-0.222 (-6.49)	-0.172 (-4.97)	-0.239 (-5.86)
Constant	2.851 (7.24)	1.328 (3.32)	-0.065 (-0.14)
μ_1	1.210 (79.72)	1.156 (87.18)	---
μ_2	2.109 (116.3)	1.626 (103.5)	---
Chi-Square	1821.15	1360.61	1303.84

Table 1 (Concluded)
 Youth Alcohol Demand Equations
 Panel B: 1989 Sample

Variable	Drinking in the Past Year	Drinking in the Past Month	Drinking in the Past Two Weeks
Beer Tax	-714.933 (-3.24)	-344.367 (-1.49)	-323.858 (-1.15)
Minimum Legal Drinking Age	-0.068 (-1.08)	-0.070 (-1.09)	-0.045 (-0.59)
Lower Border Age Indicator	--- ---	--- ---	--- ---
Male	0.261 (13.49)	0.253 (12.69)	0.430 (18.04)
Black	-0.688 (-20.83)	-0.643 (-18.07)	-0.707 (-15.43)
Other Race/Ethnicity	-0.418 (-14.59)	-0.362 (-12.04)	-0.328 (-9.07)
Age	-0.077 (-4.26)	-0.015 (-0.80)	0.038 (1.71)
Income	33.266 (11.38)	35.471 (11.77)	30.238 (8.47)
Work Less than Half-Time	0.015 (0.57)	0.012 (0.45)	-0.015 (-0.46)
Work More than Half-Time	0.047 (1.45)	0.036 (1.08)	0.030 (0.73)
Infrequent Religious Participation	0.010 (0.31)	-0.022 (-0.70)	-0.109 (-2.96)
Frequent Religious Participation	-0.245 (-8.10)	-0.258 (-8.32)	-0.288 (-7.92)
Constant	3.804 (2.80)	1.968 (1.40)	-0.267 (-0.16)
μ_1	1.267 (86.73)	1.130 (83.65)	--- ---
μ_2	2.139 (117.7)	1.551 (94.82)	--- ---
Chi-Square	1344.07	1101.59	982.22

Table 2
Policy Simulations*

Policy Simulation/ Drinking Category	Drinking in Past Year	Drinking in Past Month	Drinking in Past Two Weeks
Panel A: 1982 Sample			
Actual Distribution			
Abstainers	10.91	28.95	60.59
Infrequent Drinkers	38.23	43.46	
Fairly Frequent Drinkers	31.86	13.21	
Frequent (Heavy) Drinkers	19.00	14.28	39.41
Uniform 21 Year MLDA			
Abstainers	12.07 (+10.62)	31.10 (+7.58)	62.22 (+2.65)
Infrequent Drinkers	39.45 (+3.20)	43.53 (-0.30)	
Fairly Frequent Drinkers	31.06 (-2.52)	12.51 (-5.20)	
Frequent (Heavy) Drinkers	17.42 (-8.31)	12.86 (-9.21)	37.78 (-4.08)
Uniform 18 Year MLDA			
Abstainers	10.60 (-2.86)	27.89 (-3.56)	60.45 (-0.26)
Infrequent Drinkers	37.87 (-0.94)	43.67 (+0.02)	
Fairly Frequent Drinkers	32.07 (+0.66)	13.52 (+2.47)	
Frequent (Heavy) Drinkers	19.46 (+2.42)	14.92 (+5.33)	39.55 (+0.40)
Inflation Tax			
Abstainers	19.75 (+80.94)	41.08 (+42.04)	67.87 (+11.98)
Infrequent Drinkers	44.27 (+15.81)	41.31 (-5.37)	
Fairly Frequent Drinkers	25.57 (-19.74)	9.54 (-27.70)	
Frequent (Heavy) Drinkers	10.41 (-45.19)	8.07 (-43.03)	32.13 (-18.43)
Panel B: 1989 Sample			
Actual Distribution			
Abstainers	15.34	39.10	68.12
Infrequent Drinkers	44.33	41.25	
Fairly Frequent Drinkers	27.12	9.54	
Frequent (Heavy) Drinkers	13.21	10.12	31.88
Inflation Tax			
Abstainers	18.64 (+21.53)	41.54 (+6.24)	70.20 (+3.06)
Infrequent Drinkers	46.01 (+3.76)	40.50 (-1.79)	
Fairly Frequent Drinkers	24.74 (-8.75)	8.91 (-6.58)	
Frequent (Heavy) Drinkers	10.61 (-19.65)	9.05 (-10.58)	29.80 (-6.54)

* Numbers reflect the actual/predicted percentage of youths in each category. The number in parentheses reflects the percentage change in the number of youths in each category (compared to the actual distribution).