Methodology

Assessing costs from state alcohol tax increases on the basis of individual drinking patterns, income and employment

Alcohol consumption data came from the 2011 Behavioral Risk Factor Surveillance System (BRFSS) survey. The BRFSS is a state-based random-digit-dial telephone survey of people aged ≥18 years of age that is conducted by the Centers for Disease Control and Prevention in conjunction with state health departments (www.cdc.gov/brfss, www.cdc.gov/brfss/technical_infodata/quality.htm).

The BRFSS asks questions about drinking frequency and the average number of drinks consumed during drinking days during the past 30 days. To determine average daily alcohol consumption by an individual, a participant's frequency of drinking-days in the past 30 days was multiplied by their usual number of drinks consumed per drinking-day, and divided by 30. This can be converted into total annual consumption by multiplying by 365. The survey also collects information about the frequency of binge drinking occasions (consuming ≥5 drinks for men or ≥4 drinks for women) during the past 30 days.

For this report, excessive drinkers were defined as those reporting any of the following: binge drinking; heavy drinking (average daily consumption of >2 drinks per day for men or >1 drink per day for women); or any alcohol consumption among those aged ≤20 years of age. Non-excessive drinkers were defined as drinkers who did not meet criteria for excessive drinking.

We modeled the total increase in yearly alcohol costs (inclusive of beverage price plus taxes) to individuals based on series of hypothetical tax increases of $0.05, $0.10, and $0.25 per drink, and 5% of the current price of a drink. We assumed that these tax increases would be applied to all alcoholic beverage types (e.g., beer, wine and liquor). The cost of an average drink by beverage type based on data from Impact Databank, and weighted by state-level beverage consumption (the proportion of drinks consumed in each state in the form of beer, wine and liquor).

Laws of economics dictate that when things become more expensive, people purchase less of it, and the same is true for alcohol. Using an economic measure called price elasticity, one can calculate how many fewer drinks a person would consume each year given a particular tax increase. Total alcohol-related costs (alcohol plus taxes) was estimated before and after a tax increase, and the net cost from a hypothetical tax increase was determined by subtracting total alcohol-related costs before a tax increase from the total alcohol-related costs after a tax increase.

Per capita costs (i.e., additional costs on an individual basis) and aggregate costs (i.e., additional costs summed among a particular group) were assessed on the basis of alcohol consumption characteristics (excessive vs. non-excessive drinkers), household income levels, and employment status (employed for wages vs. not employed). Not employed persons included those who were homemakers, self-employed, unemployed, unable to work, retired or students.

Modeling societal impacts of changes in state alcohol prices

Taxes on alcoholic beverages can reduce alcohol consumption while generating revenues for cities and states. The employment impact calculator was assembled using estimates obtained from modeling the impact of state alcohol tax increases using the Regional Economic Models, Inc. (REMI) simulation model and information obtained from multiple data sources.

Key steps and assumptions used in the REMI modeling:

- Use of the detailed 169-sector version of the model which includes the alcoholic beverage industry
- Modeling of four alternative tax scenarios - $.05, $.10 and $.25 per drink increases in excise taxes and 5% sales tax on alcoholic beverages
- Assumption that all tax increases are fully passed on to consumers
- Assumption that net-of tax alcoholic beverage prices assumed constant within and across states
- Assumption that differences in prices across states result from differences in state taxes on alcoholic beverages
- Modeling of alternative scenarios for spending new tax revenue (based on spending of general revenues and spending dedicated to the health care sector)

Key parameters used in the REMI modeling:

- Pre-tax alcoholic beverage prices were assumed constant at $3.14 for a six-pack ($5.58/gallon), $4.35 for a fifth of wine ($21.80/gallon), and $9.04 for a fifth of wine ($45.20/gallon). Source: NIAAA's Alcohol Policy Information System (APIS) 2011.
- State shipment data was used to estimate pre-tax increase consumption levels in each state. Source: Brewers Almanac 2011.
- Additional taxes rates were applied on top of the preexisting alcohol taxes at state level. Source: APIS 2011.
- Own-price elasticities of demand for beer at -0.50, wine at -0.64, and spirits at -0.79. Source: the Community Guide
- Assumed no cross-price elasticities of demand given lack of reliable estimates
- Markups assumed to be constant for alcohol retailing at 26.9%, for alcohol wholesale at 25.9%, and drinking places at 9.0%. Source: the Economic Census.

Estimation with the REMI model:

- Estimates of the employment impact in Arkansas, Florida, Massachusetts, New Mexico, and Wisconsin were directly modeled, with the states selected as reprehensive states reflecting geographic diversity and differences in share of employment from alcohol manufacturing and distribution
- Net employment effects were calculated by accounting for changes in individual purchases of alcoholic beverages and other goods and services, and government spending of new alcoholic beverage tax revenues

- New tax revenues were assumed to be spent in the same way as general revenues, or, in an alternative scenario, were allocated to spending on health care (consisting of the offices of health practitioners (NAICS 6211-6213), outpatient, laboratory, and other ambulatory care services (NAICS 6214, 6215, 6219), home health care services (NAICS 6216), hospitals (NAICS 622), and nursing and residential care facilities (NAICS 623).

Extension to other states and DC

- Estimates for remaining states and DC were developed based on the findings from the representative five states and using multivariate method as the average of predictions by six independent variables and their squared terms
- Independent variables for general revenue scenario included estimated state revenue generated from the tax (tax and price from APIS 2011, shipment from Brewers Almanac 2010), estimated state loss of sales for alcohol industry (tax and price from APIS 2011, shipment from Brewers Almanac 2010), state GDP for all private industries (Bureau of Economic Analysis 2007), state GDP for whole sale and retail trade (Bureau of Economic Analysis 2007), state GDP for state and local governments (Bureau of Economic Analysis 2007), state total employment in state and local government (2007 Census of Governments)
- Independent variables for health care reallocation scenario included estimated revenue generated from the tax (tax and price from APIS 2011, shipment from Brewers Almanac 2010), estimated loss of sales within alcohol industry (tax and price from APIS 2011, shipment from Brewers Almanac 2010), state GDP for all private industries (Bureau of Economic Analysis 2007), state GDP for whole sale and retail trade (Bureau of Economic Analysis 2007), state GDP for ambulatory health care services, and hospitals and nursing and residential care facilities (Bureau of Economic Analysis), and state employment in health care NAICS (2007 Economic Census)