Alcohol Use: The Effects of Drinking on Income

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10/17/07

Abstract

If it holds true that health and earnings have a significant positive relationship and that misuse of alcohol is detrimental to health, then it can be expected that increases in alcohol use will decrease income. However, the data on this matter shows otherwise. Several studies have shown that heavy alcohol users earn more than alcohol abstainers and moderate drinkers. This paper investigates the surprisingly positive relationship between earnings and alcohol use at a nation-wide level.

I. Introduction

Studies have show that alcohol abuse has large negative externalities on society. Such costs include loss of productivity, damage to property, driving accidents, and even death. The costs to society of alcohol use are often considered in public policy decisions such as determining taxes on alcohol, yet not much consideration is put into the effects on individuals. Alcohol can both negatively and positively affect a person’s life in several ways. Alcohol abuse can put a strain on marriage, damage an individual’s health, and reduce productivity at work. However, moderate alcohol use such as a glass of red wine every week can improve an individual’s cardiovascular health. Moderate and responsible alcohol use can also have positive effects in an individual’s social life such as making new circles of friends and networking. But what is the actual cost to an individual from drinking? The labor market effects of drinking are important to our society not only at an individual level, such as personal income, but also at a macroeconomic situation level in terms of overall productivity and GDP.

II. Literature Review

There has been much research done on the effects of an individual’s overall health on their income. But exactly what factors determine health? Alcohol abuse is a known risk to health, but alcohol use in
moderation can actually improve health by reducing the risk of stroke and heart attack. In a model by Becker [1], it was found that there is a significant positive relationship between health and earnings. If it holds true that health and earnings have a significant positive relationship and that misuse of alcohol is detrimental to health, then it can be expected that increases in alcohol use will decrease income. For example, a major negative labor market effect of alcohol use is that it can cause a decrease in productivity in the workplace due to missing days of work because of alcohol-related sickness and lowered focus at work due to alcohol use. This decrease in productivity can lower an individual’s income and put them at higher risk of unemployment. On the contrary, there have been many studies that have shown a positive correlation between drinking and income. In the paper “Smoking, Drinking, and Income” by Auld it was concluded that moderate drinking is associated with ten percent higher income than drinking abstention and that heavy drinking is associated with twelve percent higher income than abstention. He also found that the effects on income of drinking are sensitive to changes in age or education. For example, younger and more educated workers experience a larger increase in income from drinking than do older and less educated workers.

The focus in Ettner’s paper “New Evidence on the Relationship between Income and Health” is to find estimates of the effect on income of a variety of health issues such as illness, physical limitations, and alcohol consumption. It is concluded that there is a strong positive correlation with self-reported health status and income and a strong negative association between income and depressive symptoms, illness, and physical limitations. Ettner also found that individuals with higher incomes drink significantly more alcohol than those with lower incomes. This must be carefully interpreted due to the fact that this increase in alcohol consumption is due to a higher probability of drinking rather than an increase in the amount of consumption. It is concluded that these findings represent a higher occurrence of light social drinking among individuals with higher incomes. However, the interpretation of this positive relationship should be considered with caution. Consider that behavioral factors such as drinking, smoking, exercise, and leisure activities are actually more closely related to education than income. According to Ettner, education has a much more significant effect on income than do behavioral factors. This would therefore make alcohol use an indirect effect on income with a lot of “in-between” factors that can alter these results.

Mullahy and Sindelar expand on this idea in their paper “Alcoholism and Income: The Role of
Indirect Effects”. The authors claim that the effects of alcohol use are often underestimated in research because there is no focus on the impact of indirect effects. Although other research may control for personal characteristics like marriage and level of education, it is the effect of alcoholism on these other factors that have the most significant negative consequence on income. For example if an individual had never become an alcoholic he or she may have gone to college and established a happy marriage therefore increasing the probability of financial success. This is important because if there is only a focus on the results of consuming alcohol on income, then one would assume that “curing” alcoholism would result in a reversal or removal of those results. This may not be true because even if an individual who had once abused alcohol for several years quits, he or she is still not college educated or in a successful marriage due to their previous condition and they remain in the same financial situation. Mullahy and Sindelar are able to conclude through their empirical research that there are vital indirect effects of alcohol abuse on education and marital status. If these effects are ignored than the estimates of the costs of alcohol abuse will be understated. By acknowledging these effects, more weight can be given to the problems associated with alcoholism in a public policy setting such as suggesting prevention programs that come into play early in an individual’s life.

Another point of view that is interesting to consider in the income-alcohol relationship is that of the macroeconomic perspective. In the paper “Alcohol Abuse and Economic Conditions: Evidence from Repeated Cross-Sections of Individual-Level Data” this is exactly what is examined. This study evaluates data from the Center for Disease Control and Prevention’s Behavioral Risk Factor Surveillance System surveys over an eleven year time period from 1984-1995. The results of this study concluded that the probability of alcohol abuse is countercyclical, meaning that in times of economic recessions even those who remained employed had a higher tendency to use alcohol. Ultimately, this increase in drinking due to economic recessions is not a reflection of increased leisure time for those who are unemployed but more of a stress-induced reaction to the business cycle.

III. Model and Data

There are many other factors of life that alcohol consumption affects before it reaches an individual’s income as mentioned above. For simplicity sake the model used will only include two variables, average incomes in the United States and percent drinkers. Due to the outstanding empirical evidence that greater alcohol consumption leads to higher income the parameter estimate for percent drinkers should be positive. The model is as follows: Mean Income = B0+B1Percent Drinkers + u, where
B0 is the intercept and u is the error of the model (in this model B0>0 and B1>1). Mean income will be defined as the average income of the head of household in 2006 dollars, all races and genders, from the year 1983-2003. This data was retrieved from the United States Census website at http://www.census.gov/hhes/www/income/histinc/h09ar.html. Percent drinkers will be defined as individuals who reported consuming and average of one or more alcoholic beverages a month in that year divided by total sample size multiplied by one hundred. This data was retrieved at the website for the National Institute for Alcohol Abuse and Alcoholism at http://www.niaaa.nih.gov/Resources/DatabaseResources/QuickFacts/AlcoholConsumption/PercentAlcoholGender.htm.

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Variable Description</th>
<th>Descriptive Statistics: Mean &amp; (Standard Deviation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Income</td>
<td>The average income for the head of household for all races and genders. Data ranges from 1983-2003</td>
<td>$59,053 (5,870)</td>
</tr>
<tr>
<td>Percent Drinkers</td>
<td>The number of individuals who reported consuming one or more alcoholic beverages a month over the course of that year (includes ages 25-60 all races and genders) 1983-2003</td>
<td>62.647% (5.87)</td>
</tr>
</tbody>
</table>

IV. Results

For this empirical analysis, cross-sectional data from the period 1983-2003 was run through SAS programming. The first function that was performed was a correlation between all of the above variables. The output shows that the variables Percent Drinkers and Mean Income are not highly correlated.

Pearson Correlation Coefficients, N=31
Prob > | r | under Ho: Rho=0

<table>
<thead>
<tr>
<th>Year</th>
<th>Percent_Drinkers</th>
<th>Mean_Income</th>
<th>Mean_Income_(thousands)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>1.000</td>
<td>-0.08875</td>
<td>0.95927</td>
</tr>
<tr>
<td></td>
<td>0.7348</td>
<td>&lt;.0001</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Percent_Drinkers</td>
<td>-0.08875</td>
<td>1.000</td>
<td>-0.13309</td>
</tr>
<tr>
<td></td>
<td>0.7348</td>
<td>0.6106</td>
<td>0.6106</td>
</tr>
</tbody>
</table>
The second SAS function performed was a linear regression fashioned after the estimated model:

\[
\text{Mean Income} = B_0 + B_1 \times \text{Percent Drinkers} + u.
\]

The linear regression was estimated as:

\[
\text{Mean Income} = 74734 - 250.304 + u.
\]

Contrary to prediction, when the number of drinkers increases, average household income decreases.

**Parameter Estimates**

| Variable          | DF | Parameter Estimate | Standard Error | t-Value | Pr > |t| |
|-------------------|----|-------------------|----------------|---------|------|---|
| Intercept         | 1  | 74734             | 30185          | 2.48    | 0.0257|
| Percent_Drinkers  | 1  | -250.30453        | 481.26699      | -0.52   | 0.6106|

This model does not give the predicted output, mainly due to the fact that it is not a very sound model. The R-squared value for this regression is extremely low at only 0.0177, meaning that this model accounts for less than two percent of the variation. Also, the root mean squared value is rather high considering the data at 6008.754, meaning that the estimate of mean income is on average $6008.75 away from the actual value. It can be concluded that the variable Percent Drinkers is not statistically significant with a t-value of -0.52.

If the analysis is shifted from a statistical and regression analysis to a graphical analysis, the results are still inconclusive. When the data is imported into excel and graphed it behaves somewhat against what is expected. For example, in the early 1980’s a high percentage of drinkers can be seen yet income is at its lowest point on the graph. Also, at the point in the graph where there is a decrease in income, the percent of drinkers increases and comes back down as incomes start to increase again suggesting a negative relationship. But in other points on the graph such as from 1996-2000 incomes and the percentage of drinkers both increase simultaneously. Overall, the graph shows that income moves steadily upward and that the percent of drinkers fluctuates with little relation to changes in income.
V. Conclusions and Limitations

Due to limitations in data and an over-simplification of a complicated model, the regression model does not reveal much about the alcohol-income relationship. It would make sense to most that alcohol use would decrease productivity in the workplace and therefore lower an individual's income however there are other variables that need to be factored into this model. First alcohol use should be viewed as an indirect effect on income. Alcohol abuse directly effects educational obtainment, health, and personal relationships such as marriage, which in turn directly effects income. Another problem with this model is the data that is used to describe changes in alcohol use. This data describes changes in overall percentages of alcohol users. This was defined as individuals who report consuming at least one alcoholic beverage per month in a year all genders and races aged 25-60. A problem with this is that the data is self-reported and some individuals may underestimate their alcohol use, or they are not willing to reveal exactly how much they drink. One or more drinks per month is also a rather vague description. This can include moderate social drinkers and alcohol abusers. It would also be beneficial to separate the variables and focus on the drinking patterns of one or two particular groups of individuals such as women only or Mexican-Americans only. Better and more descriptive data along with a more complex model...
would help expand on this topic and help to more clearly answer the question: Does alcohol have a significant effect on income? However, from all of the empirical evidence mentioned in the literature above there is a high likelihood of the relationship between alcohol use and income to be positive even though the results of this study prove to be inconclusive.

References

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[1] The model on the relationship between health and income by Becker, where health is a form of human capital is mentioned by David Heien in his paper “Do Drinkers Earn Less?” which is cited at the end of this paper. The citation for the Becker model is as follows: Becker, Gary. *Human Capital.* Chicago: University of Chicago Press, 1964.

[2] In this paper by Auld, there is a focus on not only the effects of drinking on income but also the effects of smoking on income. Drinking and smoking are often considered complimentary goods to consumers so it makes sense that smoking was used as a control in this case. It was found that smokers earn eight percent less than nonsmokers.

[3] This will be the topic of my senior honors project. This question will be more definitely answered by using a complex model and by applying new and more complicated econometric techniques, along with different data from the National Longitudinal Survey of Youth.