Does alcohol consumption affect employment?

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I. Abstract

Does the average person's alcohol consumption affect their employment prospects? Settling this question empirically is a challenge, because drinking habits are correlated with many characteristics that affect employment, including employment itself. This paper uses the National Longitudinal Survey of Youth (NLSY) data from 1989 and 1994 to examine the extent of the connection between alcohol consumption and employment, using state excise taxes on alcoholic beverages to compensate for the endogenous nature of alcohol consumption. The NLSY panel survey gathered data from a randomly selected group of young men and women beginning in 1979, putting the age of the individuals in our study in 1989 and 1994 between 24 and 37. The alcohol consumption variable (X) used is the average number of drinks consumed per month by an individual, and the employment variable (Y) used is the number of weeks they were employed during the surveyed year. The model employed to estimate this relationship utilizes the dummy exogenous variable (Z) of excise tax change in between the studied years as an instrument for a decrease in alcohol consumption. This instrument is used in a difference-in-differences regression model to determine the effects of alcohol consumption on employment between the years 1989 and 1994, controlling for family income and gender. Ultimately, our estimates resulting from a 2-stage least squares regression suggest that individuals with lowered alcohol consumption experience no statistically significant increase in employment.

II. Introduction

Frequent alcohol consumption has become taboo within modern American society. Drinking is looked down upon as a character flaw, and presumably, regular alcohol consumption makes an individual unreliable and unfit for employment. Does data support this conclusion or are these sentiments exaggerated?

The hypothesis tested in this paper is that, as an individual's alcohol consumption increases, they are less likely to be employed; this can be explained by the mental and physical challenges that result during and after being intoxicated. The paper uses data from the National Longitudinal Survey of Youth from 1989 and 1994 which give demographic, labor, and alcohol consumption information for each young adult participant in both surveyed years. In order to observe the impact of alcohol consumption on employment, tax on the import and production of beer, known as an excise tax, is used as an instrumental variable.

We measured the independent variable (X), alcohol consumption, using the average number of drinks per month an individual consumes. This measure was chosen based on the procedure of similar studies and the fact that changes in excise taxes are expected to have a marginal impact on alcohol consumption. The marginal effect of a beer excise tax increase can be measured more precisely using changes in number of drinks rather than whether or not a person drinks altogether. We measure the dependent variable (Y), employment, using the amount of weeks per year an individual works. The instrumental variable (Z) is the state excise tax rates on beer between 1989 and 1994. In order to use excise tax rates as an instrumental variable, we measured changes in state beer taxes in a binary fashion--any state with a change in excise tax rates was given a dummy value of one.

Based on the findings of Chaloupka et al., Cook & Moore, and Wagenaar et al., we expected to find a negative relationship between excise tax rates and alcohol consumption. After finding this relationship between alcohol consumption and an increase in excise tax, we could confidently proceed in using an increase in excise tax dummy as an instrument for a decrease in alcohol consumption. We then used a difference-in-differences regression of the instrumented drinks per month (X) and the outcome of annual weeks worked (Y) between 1989 and 1994. Using the difference-in-differences model, we controlled for a number of family demographics that we found to be associated with alcohol consumption. With these controls, our regression analyzed

specifically how the decrease in alcohol consumption for individuals within the states with increased excise tax rate affected yearly labor outputs.

Our regression found no statistically significant correlation between alcohol consumption and employment. For this estimate to be causal a number of assumptions must hold. First, our beer excise tax instrument (Z) must be uncorrelated with other omitted variables, observed or unobserved, that could affect employment. Based on our own qualitative analysis, the states that increased their excise tax appear to be random (different political leanings, populations, geographies, etc). We evaluate this assumption in our balance test (Figure 2) and control for the few demographic features that vary between the states with and without an increase in excise taxes. Finally, within our difference-in-differences regression, there must be no additional omitted variable that would affect both employment and alcohol consumption over time. The difference in change in employment levels over time between the two state groups must be entirely attributed to the change in alcohol consumption. Again, our balance test (Figure 2) and controls should minimize any potential omitted variables.

III. Empirical Framework

The effect of interest is alcohol consumption on a person's employment, which can be expressed with the following reduced-form equation:

$$(1) \quad E_i = \alpha + \beta ALC_i + \boldsymbol{\chi X_i} + \varepsilon_i$$

In this equation, E_i is some measure of an individual's employment, such as the number of weeks worked in the past year, ALC_i is some measure of consumption of alcoholic beverages, such as number of drinks consumed in the past month, and $\mathbf{X_i}$ is a vector of individual covariates. As we are looking to find an unbiased estimate of the causal effect of alcohol consumption on employment, an analysis of this relationship must include all of the elements of $\mathbf{X_i}$ that affect both employment and alcohol consumption; however, access to many of these covariates is limited, risking omitted variable bias. Additionally, a reverse relationship likely exists where unemployment and workplace challenges can increase alcohol consumption. To compensate for these issues, we use an instrumental variable regression where changes in state alcohol excise tax rates may be used as a proxy for alcohol consumption.

Alcohol excise taxes are fees on gallons of alcohol that have been imported or produced in the U.S., imposed on both the federal and state level; the federal excise tax is priced equally for all states, whereas states impose their own additional excise taxes that are inconsistent state-to-state. The price of the excise tax varies by beverage, or, more specifically, alcohol content. Beverages with higher alcohol content are typically taxed at higher rates than beverages with lower alcohol content. Note that approximately a third of states do not impose excise taxes on distilled spirits[1] and approximately a tenth of states do not impose excise taxes on wine[2]; rather than providing licenses to retailers to purchase alcohol from third-parties, and adding an excise tax on this transaction, these states monopolize alcohol sales for distilled spirits or wines with state-operated stores. The sale of beer, on the other hand, is never monopolized by states.

Since the sale of beer is never monopolized by the state, an excise tax is always imposed on this beverage category. As a result, our analysis looks to represent all states in the relationship between state alcohol excise taxes and alcohol consumption by using a change in excise tax on beer as a proxy for alcohol consumption.[3]

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[1] States with no excise tax on distilled spirits: Alabama, Idaho, Iowa, Maine, Michigan, Mississippi, Montana, New Hampshire, North Carolina, Ohio, Oregon, Pennsylvania, Utah, Vermont, Virginia, Washington, West Virginia, Wyoming

[2] States with no excise tax on wine: New Hampshire, Pennsylvania, Utah, Wyoming

[3] Using excise taxes of beer, rather than all beverage types, is likely not a problem for our analysis. Although our measure of alcohol consumption does not account for type of beverage, finding a strong relationship between changes in excise taxes and the measure of general alcohol consumption mitigates this problem; note that if a significant relationship was not found, we would need to consider potential problems, like consumer's replacing the purchase of beer with other beverage categories, when a larger excise tax increases the price of beer.

Note that alcohol excise taxes have been widely found to affect the prices of alcohol for consumers, reducing alcohol consumption (Siegel et al. 2012, Gehrsitz et al. 2020, Chaloupka et al. 2019). Thus, a discrete change in state alcohol excise tax rates may induce changes in alcohol consumption that are uncorrelated with unobserved determinants of employment; although not directly testable, we look at evidence to support this claim of no correlation in the results section.

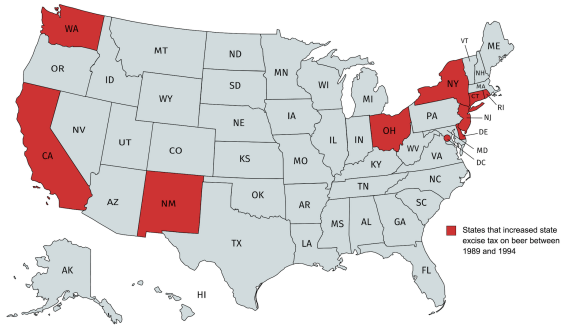

Figure 1. States that increased state excise tax on beer between 1989 and 1994
Source: "State Alcohol Excise Tax Rates." Tax Policy Center, Urban Institute & Brookings Institute.

Between 1989 and 1994, ten states, shown in Figure 1, increased their excise tax rates on beer; states with this change include California, Connecticut, the District of Columbia, Delaware, New Mexico, New Jersey, New York, Ohio, Rhode Island, and Washington. All other states maintained a constant excise tax rate on beer between 1989 and 1994. A change in excise tax is considered our "treatment," so states that had a change in excise tax are considered a part of the "treatment" group and states with no change are in the "control" group.

We use difference-in-differences methodology to examine the effect of changing excise tax rates on employment. The key estimate equation is as follows:

(2)
$$y_i = \alpha + \beta(\Delta ETax_i \times Post_i) + \delta \Delta ETax_i + \theta Post_i +$$

In this equation y_i, the dependent variable, is a measure of employment, such as weeks worked in the past year, $Post_i$ is a binary variable that is set to one if the year is 1994 (after a change in excise tax would occur), and $\Delta ETax_i$ is a binary variable set to one for states that had a change in their excise tax on beer between 1989 and 1994.

The effect of alcohol excise tax in the reduced form is captured by β.The specification controls for changes over time of average employment in states as well as average differences between states with a change in excise tax on beer and states with no change. The key identifying assumption is that any relative shift on a person's employment is attributable to the change of the excise tax imposed on beer. Since excise tax rates on beer affect the price of beer, βis the parameter of interest if we wish to predict changing alcohol consumption's effect on employment. By relating our independent variable of interest, alcohol consumption, to its instrument, the effect of changing excise tax rates on beer, we can use a 2-stage least squares regression to determine whether or not our data supports the claim that a decrease in alcohol consumption is associated with a positive change in employment.

In order to validate the use of a change in state excise tax rates on beer between 1989 and 1994 as an instrument for alcohol consumption, we run a first stage regression of alcohol consumption that includes an interaction of the dummy variables $\Delta ETax_i$ and $Post_i$, while checking the following two assumptions are satisfied: there exists a significant relationship between the $\Delta ETax_i \times Post_i$ and alcohol consumption, with |t-stat| > 3, and excise tax rates should only affect employment through alcohol consumption (so excise tax rates are uncorrelated with the error).

Additional steps are taken to minimize standard error and prevent omitted variables bias. All regressions are clustered by state to correct for autocorrelation within states and heteroskedasticity. Our balance test compares third factors between the states that had a change in excise tax rates and those without; if significant differences exist between variables that could bias the first stage or reduced form regressions, these factors will need to be added as controls in order to preserve causality. The balance test in Figure 2 supports the parallel trends assumption for our differences-in-differences analysis, as the treatment and control groups are not significantly different prior

to the increase in excise tax. While we do observe that the mean family income in the control group is significantly higher than the treatment group, we control for family income. This allows us to attribute the difference between employment in treated and untreated states to the effect of changes in alcohol consumption from excise taxes. Given that the parallel trends assumption holds, Figure 3 shows that the states that increased their excise tax on beer decreased their drinks per month by 3 drinks more than the states with a constant excise tax. This difference-in-differences estimation is significant at the 1% level. Similarly, the treatment group decreased the number of weeks worked in the past year by -.391 weeks more than the control group. However, this coefficient is not statistically significant and has a t-stat of .55.

We also control for gender because men and women often have differing drinking habits. Additionally, controlling for gender is the norm in studies that explore similar relationships (i.e. Johansson et al. 2006, Mullahy & Sindelar 1993) between alcohol consumption and employment outcomes.

	1989			1994		
	States with a Change in Excise Tax (Treatment)	States with Constant Excise Tax (Control)	Difference (Treatment-Control)	States with a Change in Excise Tax (Treatment)	States with Constant Excise Tax (Control)	Difference (Treatment-Control)
Age	28.012	28.077	-0.065	32.908	32.939	-0.031
	[0.041]	[0.071]		[0.034]	[0.077]	
Years of Education	12.839	12.961	-0.122	13.209	13.222	-0.013
	[0.055]	[0.127]		[0.058]	[0.090]	
Proportion of Males	0.535	0.525	0.010	0.517	0.498	0.019
	[0.008]	[0.012]		[0.008]	[0.017]	
Family Size	2.893	2.935	-0.042	10.346	10.485	-0.139**
	[0.032]	[0.037]		[0.029]	[0.052]	
Log(Family Income)	9.965	10.199	-0.235***	3.086	3.132	-0.047
	[0.024]	[0.056]		[0.038]	[0.053]	
Personal Salary	14376.676	18708.529	-4331.853***	21098.494	24568.829	-3470.335***
	[290.176]	[786.531]		[439.005]	[1182.630]	
Weight	160.636	159.333	1.304	170.346	169.332	1.014
	[0.557]	[1.033]		[0.721]	[1.420]	
Aptitude Test Score	41.068	41.903	-0.835	42.640	42.884	-0.244
	[1.395]	[1.371]		[1.659]	[1.601]	
Proportion Hispanic	0.111	0.267	-0.157*	0.135	0.290	-0.155
	[0.039]	[0.081]		[0.044]	[0.085]	
Proportion Black	0.266	0.193	0.073	0.288	0.199	0.089*
	[0.035]	[0.033]		[0.038]	[0.037]	
Proportion Non-Hispanic, Non-Black	0.623	0.540	0.084	0.578	0.511	0.066
	[0.044]	[0.063]		[0.049]	[0.066]	
Proportion of R's whose Mom worked	0.519	0.492	0.027	0.551	0.512	0.039
	[0.015]	[0.020]		[0.018]	[0.019]	
Proportion of R's whose Dad worked	0.752	0.730	0.022*	0.778	0.742	0.036
	[0.011]	[0.007]		[0.014]	[0.018]	
Mom Years of Education	10.346	9.987	0.360	10.521	10.129	0.392
	[0.168]	[0.291]		[0.195]	[0.291]	
Dad Years of Education	9.427	9.613	-0.186	9.740	9.700	0.040
	[0.217]	[0.278]		[0.250]	[0.427]	
Number of Siblings	3.789	3.878	-0.089	3.674	3.811	-0.138
	[0.083]	[0.110]		[0.095]	[0.084]	
Height in inches	67.067	66.834	0.233	2.042	1.911	0.131
	[0.094]	[0.165]		[0.055]	[0.064]	
Drinks per Month	15.011	16.887	-1.877	17.414	16.288	1.126
	[0.865]	[0.910]		[0.718]	[0.866]	
Days drinking in past 30	4.333	4.925	-0.592**	5.411	5.295	0.116
	[0.181]	[0.136]		[0.181]	[0.220]	
Weeks Worked	40.245	38.932	1.314	41.962	40.258	1.704**
	[0.403]	[0.778]		[0.462]	[0.701]	
Number of Observations	5427	2416		3610	1684	

The value displayed for t-tests are the differences in the means across the groups.

Standard errors are clustered at variable state.

*****, **, and * indicate significance at the 1, 5, and 10 percent critical level.**

Figure 2. Balance Test of controls in 1989 & 1994

Notes: Means are NLSY without weighting. Standard errors are adjusted for clustering at the state level.

	(1) Drinks per Month	(2) Weeks Worked
Post	2.404**	1.717***
	(.959)	(.398)
ΔETax	1.877*	-1.314***
	(1.092)	(.454)
ΔETax * Post	-3.003*	-.391
	(1.711)	(.711)
Constant	15.011***	40.245***
	(.606)	(.252)
Observations	13137	13137
R-squared	.001	.003

Standard errors are in parentheses
****p<.01, **p<.05, *p<.1*

Figure 3. Difference-in-differences of drinks per month and weeks worked between treated and control states
Notes: Standard errors are adjusted for clustering at the state level and robust to heteroskedasticity.

IV. Data

The first data set used in the analysis is the National Longitudinal Survey of Youth (NLSY) panel data. In addition to tracking the impacts of major events in the late 20th century, this panel data records information on demographics, employment outcomes, and behaviors such as drinking. We observe the NLSY cohort of men and women living in the United States from both 1989 and 1994. We generate dummy variables for race, gender, and employment. Additionally, we multiply the number of days an individual drinks by the number of drinks an individual has on an average day of drinking to create a variable for the total number of drinks an individual has in an average month. As stated previously, this drinks per month variable is our variable of interest.

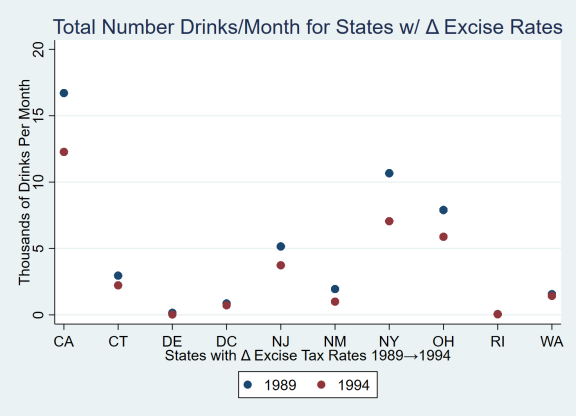

Figure 4. Number of drinks consumed in 1989 and 1994 for all states with a change (increase) in beer tax *Source: "State Alcohol Excise Tax Rates." Tax Policy Center, Urban Institute & Brookings Institute.*

Our second data set includes information on excise tax rates across each state between these two years. For the states that did have a change in their excise tax on beer, all changes were an increase in tax; these increases ranged from $0.02 to $0.17, with an average increase of $0.10. All of these changes represented more than a 25% increase in the excise tax applied to purchases of beer. Figure 4 above compares the number of drinks consumed in 1989 and 1994 for all states who had a rise in tax on beer. Note that the number of drinks consumed was lower in 1994 than in 1989 for all states in the treatment group. Outside of the 10 states that increased their excise tax, the other 40 states maintain a constant excise tax rate on beer between 1989 and 1994.

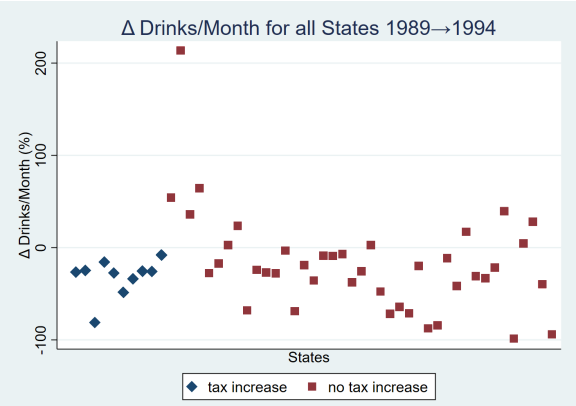

Figure 5. Change in number of drinks consumed between 1989 and 1994 for all states in the sample regardless of treatment status.
Source: "State Alcohol Excise Tax Rates." Tax Policy Center, Urban Institute & Brookings Institute.

The general pattern of the number of drinks consumed decreasing in 1994 compared to 1989 is not unique to states that saw an increase in the excise tax on beer. Figure 5 shows that the majority of states, both treated and untreated, saw a decrease in the number of drinks consumed (i.e. a negative percent change). The change in alcohol consumption for untreated states, however, has a wider spread. Although there is a trend of states reducing alcohol consumption in 1994 relative to 1989, we still look to use excise taxes to explain some of this change in drinks consumed for treated states with statistical significance.

By merging the two datasets mentioned above (NLSY and excise tax data) on state and year, we are able to create a more comprehensive dataset that allows us to understand how alcohol consumption affects employment, using state excise tax rates on beer as an instrument. Means are shown in Figure 2, broken down into groups based on year and treatment status. It is important to note that 2,863 observations were dropped during the merging process, as they did not have a state of residence or family income reported. Our combined dataset consists of 13,137 observations, all of which are used throughout the rest of our analysis.

V. Results

	(1) Drinks per Month	(2) Weeks Worked	(3) Hours Worked	(4) Number of Lifetime Jobs	(5) Employment Dummy
ΔETax * Post	-3.647***				
	(1.21)				
ΔETax	2.615**	-2.783***	-127.683***	-.022	-.043***
	(1.269)	(.562)	(36.161)	(.256)	(.011)
Post	3.102***	-.856	-.155	1.692***	-.003
	(.959)	(.537)	(28.462)	(.098)	(.013)
Drinks per Month		-.004	-8.579	.041	0
		(.206)	(11.623)	(.036)	(.005)
Constant	51.513***	-18.472*	-690.165	7.988***	-.091
	(4.455)	(10.574)	(614.5)	(2.075)	(.253)
Controls for Log(Family Income) & Gender	YES	YES	YES	YES	YES
Observations	13137	13137	13137	13137	13137
R-squared	.036	.185	.096	-.055	.117

Standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Figure 6. Instrumental Variable Regressions

Note: Standard errors are adjusted for clustering at the state level. A larger version of this table can be found in the appendix.

Assumption 1: Relevance Condition (First Stage Regression)
As stated previously, the inverse relationship between excise tax and alcohol consumption is the first assumption in our analysis. The first stage regression allows us to test this, by determining whether our instrument is valid. In other words, we are testing whether an increase in excise tax significantly decreases alcohol consumption, measured in drinks consumed per month. In the first stage regression, we regress drinks per month (X) on a dummy for being in the treatment group, a dummy for data coming from the 1994 survey, log of family income, gender, and the interaction term between the treatment and year dummies, which is also the excluded variable. We control for log(net family income) due to the significant relationship found in Figure 2 and gender due to the difference in drinking habits between men and women. As shown in Figure 6 column 1, the coefficient of the excluded variable (*treat*1994*) is statistically significant at the 1% level with a |t-stat| of 3.01. Since the value exceeds a t-stat of 3, excise tax rates are a reliable instrument for alcohol consumption. After an increase in the excise tax in 1994, the alcohol consumption in the treatment group states decreased by 3.647 drinks per month relative to the control group states. Based on the mean of 16 drinks per month consumed (shown in Figure 2), this is a 23% decrease in alcohol consumption. This demonstrates that an increase in excise tax is negatively correlated with alcohol consumption.

The results from our first stage regression are in line with past studies on the relationship between alcohol excise tax and alcohol consumption. Although comparable studies use a continuous variable for a change in excise tax, rather than a discrete one like ours, studies by Chaloupka et al., Cook and Moore, and Wagenaar et al. likewise find a significant decrease in alcohol consumption as a result of excise tax increases.

Assumption 2: Exclusion Restriction
Our second assumption is that excise tax rates should only affect employment through alcohol consumption

(i.e. excise tax rates are uncorrelated with the error). Although this assumption is not directly testable, there is evidence supporting it: the balance test in Figure 2 indicates other characteristics of the treatment and control groups, including drinks per month, are not significantly different before the change in excise tax. Therefore, the changes that later occur in excise tax are essentially randomly assigned, so on average third factors are balanced and excise tax is uncorrelated with the error. In other words, although increasing excise taxes on alcohol is not something that states randomly choose to do ,with two states on the west coast, a cluster of northeastern states and two states in the heart of the country, these states are a representative sample of the rest of the country.

Second Stage Regression: Alcohol Consumption on Employment Outcomes

Our second stage 2SLS regression of weeks worked per year on the predicted drinks per month plus controls in Figure 6 column 2, shows a small and insignificant result. The coefficient of interest *(*on *Drinks/Month)* indicates that an increase of one drink per month is associated with a .004 decrease in weeks worked per year (i.e. less than a 1 day decrease in days worked per year). However, we cannot say this with any confidence as the P value is very high (P = 0.99) due to an extremely low t-stat (|t-stat| = 0.02). It is also important to note that the mean weeks worked per year in the treatment group is 40.245. Our estimate is not substantively meaningful as the change in weeks worked is only 0.01% of the mean value. Thus, we fail to reject the null hypothesis that there is no relationship between the drinks per month a person consumes and the number of weeks they are employed throughout the year. We also ran regressions to determine the impact of an increase in drinks per month on other employment outcomes such as hours worked in the last year, number of jobs, and a dummy for being employed. These analyses are shown in columns 3-5 of Figure 6 above. We did not find a significant relationship in any of these analyses. Thus, our instrumented difference-in-differences regression did not show a relationship between drinks per month and any of our employment outcomes: weeks worked, hours worked, number of jobs, or the employment dummy.

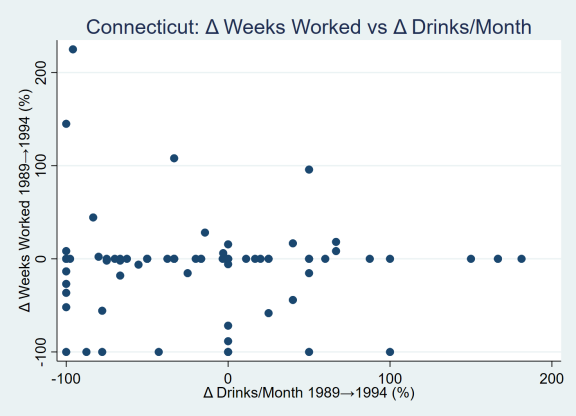

Figure 7. Visualizing the relationship between change in weeks worked and change in drinks per month between 1989 and 1994 for one of the ten states that changed excise tax rates on beer
Source: "State Alcohol Excise Tax Rates." Tax Policy Center, Urban Institute & Brookings Institute.

The relationship between change in employment and change in alcohol consumption is displayed for individuals in Connecticut, a state whose excise tax on beer changed between 1989 and 1994, in Figure 7. While the drinks per month that an individual consumes saw a great variety of change between these two years, the number of weeks worked remained relatively consistent for most people - the change in weeks worked for people in Connecticut typically hovers around zero percent. A similar pattern exists for all other states, regardless of whether excise taxes changed or not.

Our results are not surprising given trends shown in previous literature, which do not find a consistent association between increased alcohol consumption and worse employment outcomes. While several studies actually indicate that alcohol consumption increases employment outcomes (Berger & Leigh 1988, French & Zarkin 1995), others find a significant decrease in employment outcomes as a result of increased alcohol consumption (MacDonald & Shields 2004, Kenkel & Wang 1999). There are also studies that find no significant result in either direction, similar to our results. For example, Bamberger et al. conducted a research study on the impact of college alcohol consumption on employment upon graduation. The findings of this research align with ours despite differences in the analytic approach employed by the authors of this

article. Using the data of 827 college seniors in the US, they similarly found no negative or positive impact of modal alcohol consumption on the likelihood of employment upon graduation. However, it is important to note they did find a significant effect for the frequency of heavy drinking. It is possible that if we looked specifically into the impacts of heavy drinking (rather than just an increase of one drink per month), we would find significant negative results. Nonetheless, there are many conflicting findings in current research on the impact of alcohol consumption on employment outcomes.

VI. Conclusion

Our regression model shows a significant negative relationship between excise tax and alcohol consumption; after 1994, the alcohol consumption dropped by 3.647 drinks per month in the states with an increase in excise tax on beer (when controlled for socio-economic status and gender). Nevertheless, the model also demonstrates that there is no significant relationship between alcohol consumption and employment.

Our study has a number of limitations. First, our instrumental variables approach can be interpreted as a local average treatment effect (LATE) of alcohol on weeks worked. Specifically, our study did not find significant effects between alcohol consumption and weeks worked when the change in consumption corresponds to an average beer excise tax price increase of 10 to 20 cents. In other words, the relationship studied may apply only when the change in beer consumption is equal to the instrumented difference created by the additional excise taxes. Since both this change in price and our significantly associated change in consumption are relatively small, our results may only apply at small levels of alcohol consumption. Our results may not fully capture the relationship between very large changes in alcohol consumption and weeks worked. However, since our resulting relationship between drinks per month and weeks worked was strongly insignificant and close to zero, we believe that expanding our conclusions to other reasonable amounts of consumption would be appropriate.

Second, it is likely that certain cities and municipalities imposed their own alcohol tax rates (Wada et al. 2017). This may cause variation we haven't accounted for in the price of alcohol. Another potential limitation is that people tend to underreport their alcohol consumption and income (Livingston & Callinan 2015). The underreporting of alcohol consumption and income, and inconsistency of tax rates in certain cities and municipalities could potentially bias our estimates.

Our study is also limited in that the age of participants in the NLSY data ranged only from 24 to 37, so our findings might not represent the relationship between alcohol consumption and employment in the larger U.S. population. Therefore, our research study can be improved by expanding the age range of survey participants. It is possible that the impact of alcohol consumption on employment outcomes is more significant for older individuals.

Lastly, it is also important to mention that only beer excise tax data was used in our study, since data on wine and spirits excise tax was incomplete. Although an increase in beer excise tax always corresponded with an increase in wine and spirits excise taxes, using more comprehensive data, which includes wine and spirits excise tax rates, could improve our study.

Despite these limitations, our analysis suggests there is no significant relationship between alcohol consumption and employment. In terms of policy, employment outcomes should not be considered in determining excise tax levels, as there is no clear evidence that employment outcomes can be moved as a result of changes in alcohol consumption. In other words, we found that an increase in excise tax on beer does reduce an individual's alcohol consumption. However, governments are not successful in increasing employment through decreasing alcohol consumption. Thus, our findings do not support increasing excise taxes to improve employment rates.

For future research, we recommend looking specifically at heavy drinkers to see how the relationship between alcohol consumption and employment might be different for this subgroup. These individuals experience the burdens of an

increase in excise tax more than lighter drinkers, but may be more resistant to changing their alcohol consumption. Moreover, due to the extremely high levels of alcohol consumption among this group, their employment outcomes may be impacted more significantly.

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Appendix

	(1) Drinks per Month	(2) Weeks Worked	(3) Hours Worked	(4) Number of Lifetime Jobs	(5) Employment Dummy
ΔETax * Post	-3.647***				
	(1.21)				
ΔETax	2.615**	-2.783***	-127.683***	-.022	-.043***
	(1.269)	(.562)	(36.161)	(.256)	(.011)
Post	3.102***	-.856	-.155	1.692***	-.003
	(.959)	(.537)	(28.462)	(.098)	(.013)
Drinks per Month		-.004	-8.579	.041	0
		(.206)	(11.623)	(.036)	(.005)
Constant	51.513***	-18.472*	-690.165	7.988***	-.091
	(4.455)	(10.574)	(614.5)	(2.075)	(.253)
Controls for Log(Family Income) & Gender	YES	YES	YES	YES	YES
Observations	13137	13137	13137	13137	13137
R-squared	.036	.185	.096	-.055	.117

Standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Figure 6. Instrumental Variable Regression