Analysis of Relationship Between Alcohol Consumption and People's Unemployment

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Abstract. This paper examines the correlation between unemployment in the labor market and individual consumption of alcohol. It uses the data from the National Longitudinal Survey of Youth (NLSY). It includes information on labor market results, alcohol consumption, and assorted individuals' demographics every two years in 1989 and 1994. The data are restricted to young adults between the ages of 24 and 32 in 1989 (and hence 29-32 in 1994). Each person has a unique identifier (variables named id), and the year is represented by the specified variable. The variable names of these data use STATA software for data processing and variable analysis. The standardized data were used to analyze the main components of years, including 1989 and 1994. The PCA method needs to evaluate the Eigenvalue of the result, which reflects the degree to which the main component affects the original variable. And KMO is used to measure the strength of the correlation between variables by comparing the correlation coefficients of the variables with the coefficients of bias correlation. By analyzing these variables' data, the number of days in the last month the individual has at least 1 drink is significant with the unemployment rate. One interesting phenomenon in other possible variables is the impact of the number of years of education the individual's father has on the unemployment rate is not significant in 1989, but the dad's education back to significant variables list.

Keywords. *Alcohol consumption, Unemployment, Labor market, Adult.*

1. INTRODUCTION

Numerous studies have documented alcohol consumption and abuse concerning determining economic outcomes such as unemployment rates and earnings. Most of these studies have found that alcohol abuse negatively affects employment and wages in various ways [1]. Alcohol abuse directly affects productivity through injury rates, absenteeism, and more unsatisfactory work performance. Lower productivity is associated with a higher likelihood of unemployment and reduced earnings, especially in a competitive labor market. However, there has some research on the causal mechanisms from alcohol use to labor market outcomes.

Moreover, some economists also believe that there has an inverse effect of unemployment on alcohol use. They argued that it is possible that unemployment also reduces alcohol consumption because unemployed people have less income to purchase alcohol [2]. If lower consumption means less alcohol abuse, then unemployment could also reduce the incidence of alcohol abuse.

According to Peirce, Wilson highlighted that unemployment might lead to financial stress and anxiety from a psychological perspective[2]. Family discord can lead to increased alcohol consumption. In contrast, work is considered the majority of the stress in daily life, and individuals can drink to relieve the stress caused by work [3]. However, during economic downturns, employed individuals may reduce their alcohol consumption to avoid potential job loss or income reduction [3]. From a financial perspective, if we considered alcohol consumption as a normal good, then a decrease in income due to unemployment will reduce alcohol consumption.

On the other hand, since unemployment increases stress, unemployment may lead to alcohol abuse, and unemployed people have more leisure time drinking [1]. At the same time, a better understanding of the relationship between employment status and drinking has crucial policy implications. Ettner illustrated that if unemployment leads to more drinking, then macroeconomic policy decisions should consider the potential indirect social gains [1]. The strong positive correlation between drinking and unemployment has vital implications for prevention and treatment programs for drinking since efforts to treat drinking disorders may have to be stepped up in times of high unemployment [4]. If expanded regulatory oversight by the federal and state governments leads to increased unemployment and increased drinking problems, the associated externalities may offset regulation's beneficial effects. Therefore, studying the correlation between alcohol consumption and unemployment is very herbal for this society's functioning.

Mullahy and Sindelar study how alcohol abuse can influence employment [3]. Based on data, including the sample of approximately 15,000 observations that males ages from 25 to 59, from the 1988 Alcohol Supplement of the National Health Interview Survey, Mullah and Sindelar find, for both men and women, that alcohol abuse results in reduced employment and increased unemployment. And the estimates from which they drew these inferences were obtained via the instrumental variable method, which was implemented to account for the potential endogeneity of problem drinking. They also find that using the instrumental variable approach suggests that the negative impact of problem drinking on employment is even greater than that estimated using the OLS approach. Butler et al examined the within-person relationships between daily work stressors and alcohol consumption over 14 consecutive days and based samples of 106 employed college students [5]. Using a tension reduction theoretical framework, authors predicted that exposure to work stressors would increase alcohol consumption. After controlling for the day of the week, the authors found a positive relationship between hours worked and the number of drinks consumed. The workload was unrelated to alcohol consumption, and work-school conflict was negatively related to consumption, especially when students expressed strong beliefs in the tension reducing alcohol properties. Teixidó-Compañó et al aimed to determine the differences between women and men engaging in hazardous drinking, focusing on the educational level and their employment status in Spain [6]. This study's data is derived from the use of alcohol and drugs among 25 to 64-year-olds in the Spanish Household Survey in 2013. There are a total of 14,113 people in the data, including 7,942 men and 6,171 women. The authors discovered that heavy use of drugs was higher in men. They also discovered that women with a higher educational status were more prevalent to drinking than their male counterparts. However, men were more likely to engage in more drinking habits than women of the same educational level. Of repute in the study was that educational level and employment status are both significant factors for alcohol consumption. Mikael Svesson and Curt Hagquist study how unemployment is associated with the use of alcohol in teenagers and the experience of binge drinking at a time when big changes have occurred in society. They use repeated cross-sectional adolescent study data from a Swedish region and combine this data with local unemployment data for the same period. The results show that the unemployment rate is negatively related to the use of alcohol in adolescents and the experience of binge drinking. Testing gender differences in the relationship shows that the results are dominated by the girl's behavior, whereas drinking among boys does not show any vital relationship with changes in the unemployment rate [7]. Edward S. Greenberg and Leon Grunberg research the general proposition that work alienation (defined as low job autonomy, low use of capacities, and lack of participation in workplace decision-making) is associated with alcohol consumption's negative consequences. They use a sample of production workers from union, nonunion, production cooperative, and employee stock ownership plan (ESOP)15 mills in the wood products industry in a single region of the United States, the Pacific Northwest. The result shows that the general claim is supported but that the pathways tend to be indirect rather than direct, mediated by a sense of job satisfaction and respondents' beliefs about the effectiveness of drinking as a means of coping [8]. Beard et al aimed to better understand the complex relationships among social position, income, and educational level with alcohol consumption in England [9]. The study's importance was the level of alcohol consumption that the participants engaged in and how it affected their social position, educational level, and income. They obtained 57,807 English drinkers to participate in their study between March 2014 and April 2018. The study measured and collected the daily consumption and drinking frequency of these participants as research data. The authors discovered that the social grade was the strongest determiner for alcohol consumption, and those in professional employment engaged in more episodes of drinking. Additionally, the participants with a higher educational grade drank more, implying that educational level was a positive factor for drinking. In conclusion, social grades and educational attainment are strong factors for the level of alcohol consumption.

The objective of the study was to investigate the association between unemployment and alcohol-consumption. Therefore, this paper evaluated individual factors, including wages and hours worked and family factors, such as parental education and family income,

for 16,000 individuals in the United States during the two years 1989 and 1994. Also, it validated whether alcohol intake and unemployment are related to these variables by examining changes in these variables. The relationship between alcohol abuse and unemployment has been agreed that is time-dependent [1]. In this study, we assume that the nature of the relationship may change with prolonged unemployment and has a relationship with family factors.

2. METHOD

2.1. PCA / KMO

The standardized data were used to analyze the main components of years, including 1989 and 1994. 20 standardized data were obtained by the PCA method. Also, it needs to evaluate the result's Eigenvalue, which reflects the degree to which the main component affects the original variable. The results above 0.6 are acceptable. If it is less than 0.6, the main component is not explained enough and should be ignored.

Besides, KMO (Kaiser-Meyer-Olkin) method was also applied for the second step of filtering. In addition, KMO is used to measure the strength of the correlation between variables by comparing the correlation coefficients of the variables with the coefficients of bias correlation, which contains the values between 0 and 1. When the sum of the squares of the simple correlation coefficients between all variables is much greater than the bias correlation coefficients. The closer value of KMO is to 1, the stronger the correlation between the variables. If the correlation coefficient is relatively high for the correlation coefficient, the main component analysis cannot play a very good effect on data. The general criteria for judging are as follows:

- 0.00-0.49 (unacceptable)
- 0.50-0.59 (miserable)
- 0.60-0.69 (mediocre)
- 0.70-0.79 (midding)
- 0.80-0.89 (meritorious)
- 0.90-1.00 (marvelous)

2.2. Data Processing

Before data analysis, it usually needs to standardize the data first. There are many ways to standardize data. Here we adopt z-score standardization, and the original data will be transformed into dimensionless variables. The variables include personal factors such as income, hours of work and unemployment, unemployment rate, IQ, education, height, and weight, and family factors such as parent's education, family population, and family income. Besides, the variables closely related to drinking

are also taken into account, such as frequency of drinking and the average number of drinking. The expected value and the standard variance of the normalized variables are 0 and 1, respectively. Besides, the other data variables can only explain the categories and attributes and have no other effect, so it makes no sense when these variables are standardized, such as id, year, age, region, race, sex, and health. Therefore, these variables are not normalized.

3. RESULTS

We analyzed several variables in the U.S. data for 1989 and 1994, with total wages and salary income in the past calendar year (wgsal) and the total number of hours worked in the past calendar year (hrswrk) were the two variables that changed most significantly during these five years. Concerning wgsal, it was $15,735.22 per capita in 1989 and $21,133.64 per capita in 1994, an increase about 34% over the five years. Regarding hrswrk, in 1989, the annual working hours per capita was 1704.58 hours, and in 1994, the working hours per capita was 1740.23 hours, an increase of 2%. Afterward, the results of PCA and KMO are shown in Table 1 and Table 2, respectively.

Table 1. Index selection for 1989

Component	PCA Eigenvalue	KMO Value
wgsal	4.13	0.8
hrswrk	2.32	0.87
wkswrk	1.69	0.62
wksue	1.41	0.31
wksolf	1.17	0.61
numjob	1.07	0.88
days	1.01	0.72
perday	0.97	0.64
dadhg	0.86	0.81
momhgc	0.82	0.82
numsib	0.78	0.91
sibid1	0.76	0.82
afqtrev	0.68	0.79
height	0.62	0.65
weight	0.43	0.56
higrad	0.41	0.78
numkid	0.32	0.67
famsz	0.28	0.66
faminc	0.19	0.53

Overall, in the 89-year data, we can choose days, perday, dadhgc, momhgc, numsib, sibid1, afqtrev, height as variables.

Table 2. Index selection for 1994

Component	PCA Eigenvalue	KMO Value
wgsal	4.63	0.81
hrswrk	2.37	0.92
wkswrk	2.05	0.57
wksue	1.53	0.24
wksolf	1.20	0.53
numjob	1.07	0.77
days	0.97	0.60

perday	0.95	0.63
dadhg	0.85	0.83
momhgc	0.82	0.83
numsib	0.74	0.90
sibid1	0.66	0.79
afqtrev	0.59	0.82
height	045	0.68
weight	0.41	0.56
higrad	0.33	0.80
numkid	0.32	0.55
famsz	0.16	0.53
faminc	0.13	0.72

Overall, in the 94-year data we can choose days, perday, dadhgc, momhgc, numsib, sibid1 as variables.

Therefore, it can choose days, perday, dadhgc, momhgc, numsib, sibid1 as variables from 1994. According to the index selection of Table 1 and Table 2, the linear regression was conducted, and the coefficients were obtained(Table 3 and Table 4).

Table 3. Linear regression results for 1989

wksue	Coef.	St.Err.	t-value	p-value
days	0.048	0.012	3.98	0.000
perday	0.016	0.012	1.37	0.171
dadhgc	-0.007	0.014	-0.47	0.638
momhgc	0.028	0.014	1.98	0.047
numsib	0.042	0.012	3.42	0.001
sibid1	0.031	0.012	2.59	0.010
afqtrev	-0.157	0.013	-11.68	0.000
height	0.028	0.012	2.42	0.015

Table 4. Linear regression results for 1994

wksue	Coef.	St.Err.	t-value	p-value
days	0.047	0.012	3.99	0.000
perday	0.024	0.012	2.03	0.042
dadhgc	-0.054	0.014	-3.98	0.000
momhgc	0.008	0.014	0.61	0.545
numsib	0.064	0.012	5.36	0.000
sibid1	0.057	0.012	4.90	0.000

4. DISCUSSION

4.1. overall

In the five years from1989 to 1994, the annual per capita GDP in the United States was $22,857.15 and $27,694.86 respectively, an increase of 1.21 times, which is small than the per capita wage income (1.34 times) of selected data. The U.S. government faced high deficits and high national debt in 1989. It stimulated the economy by repeatedly lowering interest rates and launching the Gulf War, but it was difficult to get out of the recession. The crisis lasted for a short period, but after the crisis, the U.S. economy remained in a prolonged depression with a slow and sluggish recovery. The U.S. was facing high national debt and deficit until 1989. During the period from 1989 to 1994, the policy of tax increases for the rich, tax cuts for the middle class, streamlining of institutions, cuts in government spending, welfare reform were adopted. Until 1994, the U.S. economy began to rebound faster, sustained growth of about 4%, inflation was controlled at less than 3%. The Federal Reserve in July 1990 to September 1992 had 17 consecutive gradual interest rate cuts, short-term interest rates from 8% to 3%, which promote investment and consumption rose and led to the development of the entire economy. The overall U.S. economy is slowly getting better during the five years [1]. According to Xu and Chaloupka on alcohol price statistics from 1980-1995, declining prices of alcoholic beverages were the rest of the increase in affordability [10]. Changing in prices and income had a multiplier effect on affordability. Furthermore, declining federal and state taxes on alcoholic beverages played a key role in the price trend.

4.2. The difference between 89 and 94

4.2.1. similarity

For the variables chosen from the five years from 1989 to 1994, the same variables days, perday, dadhgc, momhgc, numsib and sibid1 are chosen in both models. The signs of these variables are the same. Each variable

is analyzed holding other factors constant, and it has impact on wksue at 5% significance level in the model. The variable days has a significant positive effect on wksue in both models. If the days that the individual had at least 1 drink in the last month increases 1 day, the total number of weeks of unemployment in the past calendar year will increase 0.047 weeks in 1994. The variable perday has a significant positive impact on wksue for 1994, but not for 1989. Suppose the individual's average daily drinking volume in a day increases 1 unit. In that case, there will be an increase of 0.024 weeks in the total number of weeks that the individual is unemployed in the past calendar year in 1994. The variable dadhgc has a significant negative effect on wksue for 1994, but not for 1989. If the individual's father's years of education increase 1 year, the total number of weeks that the individual is out of work in the past calendar year will decrease 0.054 weeks in 1994. The variable momhgc has a significant positive effect on wksue for 1989, but not for 1994. If the individual's mother's years of education increase 1 year, the total number of weeks of unemployment in the past calendar year will increase by 0.028 weeks in 1989. The two variables that are numsib and sibid1 have a significant positive impact on wksue in both models. These same variables were selected according to table 1 and table 2.

4.2.2. difference

Based on the display of linear regression results, it is known that the percentile in which the individual scored on intelligence tests in 1979 and their personal height were present in 1989 but disappeared in 1994. This suggests that the two were related to the number of weeks of unemployment in 1989 but did not exist in 1994.

O Hüblerfound that women who were shorter than average and men who were taller than average but not in the highest body had a significant wage advantage, based on data from the Germany Socio-Economic Group, the relationship between height and wages is investigated by gender. These differences can be divided into donations and unexplained effects(discrimination) [11]. There are all kinds of discrimination in employment, but height is usually ignored when people talk about types of discrimination. It attaches great importance to height in life, whether social, sexual, or economic aspects have a certain height preference. Economist John Kenneth Galbraith describes our preferential treatment of tall people as "one of the most blatant and forgiven prejudices in our society". According to IB Rosenberg, high-levelism in the workplace, especially prejudice against short people, faces a unique disadvantage over tall people. This gap is filled by reviewing existing federal anti-discrimination laws (Title VII of the Civil Rights Act and the Americans with Disability Act of 1990) to prevent and not prevent height bias in the workplace. Local remedies for height discrimination are also available after state anti-discrimination laws [12].This may be why the correlation between height and unemployment disappeared in 1994.

4.2.3. insignificance

As showing in the linear regression results, in 1989, two variables are not counted in very related and important variables : perday, dadhgc, and in 1994, the momhgc is not important, but the perday and dadhgc back to important variables list.

The article "The Effect of Parents' Employment on Children's Educational Attainment" written by John Ermisch and Marco Francesconi, discusses the relationship between parents' education and income [13]. The result shows that mothers make a negative and significant effect on the child's educational attainment of the extent of mother's full-time employment when a child was aged 0-5. And the effects of a mother's part-time employment and father's employment are smaller and less well determined and negative. Besides, the context of the conditional demand function framework from the article shows that a higher full family income increases children's educational attainment. In the pre-condition of full family income, a higher mother's or father's wage lowers their children's educational attainment. And in the article, "Adult spina birdie survey in Scotland: educational attainment and employment" written by Smith AD, the author discusses the relationship between educational attainment and employment [14]. The result shows that lots of adults had completed tertiary education, but large numbers were unemployed. Whats' more, those in employment received salaries lower than expected from their educational achievements, despite reliable employees.

In conclusion, mom and dad's education can influence a child's educational attainment to a certain degree. However, educational attainment is not the influential reason for unemployment. So the variables dadhgc and momhgc are not so important.

For variable perday, there is a big debate that alcohol consumption is good or bad for employment. Some researches show that alcohol consumption can lower working preferences, so that it lowers employment. Nevertheless, in the article "Is moderate alcohol use related to wages? Evidence from four worksites", the result shows controlling for other variables and conditional on working, moderate alcohol users have higher wages than abstainers and heavy drinkers [4]. Thus, the variable perday may not so important due to the fuzzy definition in drinking.

5. CONCLUSION

By applying the data from the National Longitudinal Survey of Youth (NLSY) and information on labor

market results, alcohol consumption, and assorted demographics, which were provided to individuals two years in 1989 and 1994, we can draw the result that there is some relationship between alcohol-consumption and unemployment. Like lots of other researches in this field, it is hard to make a simple, precise, and reliable conclusion. However, we find out that the variable days have a significant impact on the variable wksue. In other words, there is a strong relationship between the number of days in the last month the individual has had alcohol and the total number of weeks spent unemployed in the past calendar year. Also, other variables have a significant, directly or indirectly, impact on unemployment.

In conclusion, we cannot say that alcohol consumption is the only reason unemployment is changed because there are many variables that can also influence unemployment. Nevertheless, there must be a strong relationship between alcohol consumption and unemployment.

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