

Alcohol and Happiness: a Panel data analysis

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Abstract

The harmful effect of alcohol is well known, worldwide over 5% of all deaths is related to the harmful use of alcohol, this represents around 3 million death each year. However, alcohol is also known as the cultural, social practices and a form of lifestyle globally. This makes the control of the harmful use of alcohol extremely difficult. If people are happy with their consumption of alcohol, it is difficult to convince them not to trace their happiness. This paper examines the association between happiness and the consumption of three types of alcohol (Beer, Wine and Spirits) with a fixed effect panel data model using global data from 2010 to 2015. The empirical result shows that apart from happiness, income, social support and life expectancy also take a role in affecting alcohol consumption. Indeed, different regions have different preference in the consumption of alcohol. Europeans tend to enjoy wine with the association between wine and happiness being the largest while beer tends to bring happiness and enjoyment to people in Western Pacific and America. Although spirits take up the largest portion (over 44.8%) of worldwide, the association between happiness and spirits are weak.

1. Introduction

Alcohol has been the lifestyle, the culture and social practices in the human history. All countries have their own ways of enjoy alcohols. In Europe, the culture of wine are colorful. France wine festival, Germany beer festival and UK whisky festival reflect the importance of alcohol in western culture. In China, the famous Chinese poet, Li Bai (701-762) was a great lover of alcohol. In one of his poet, he wrote “When one drinks with friends, even thousand cups are not enough” (酒逢知己千杯少). This reflects that in Chinese culture, drinking is a way to consolidate friendship, develop better working relationships and bring business partners together. In Japan drinking is considered as a complementary part of the working life, the word “nomunication” is a combination of the word the Japanese verb *nomu*--“to drink”--and communication or simply work-related drinking. Indeed in many cases, motivation for drinking simply depends on expected emotional or mood factors such as enhancing pleasure or reducing tension.

The well-known “Happy hour” linked happiness and alcohol together in our daily life. However, the harmful effect of alcohol is also well-known. According to World Health organization (2018), over 3 million deaths per year are caused by the harmful use of alcohol, worldwide and over 200 disease such as behavioral disorders, non-communicable condition as well as injuries resulting from over consumption of alcohol. Rosón et al. (2010), reported that the prevalence of patients’ alcohol-drinking problems ranged from 12% to 26% in western countries. Tsai et al. (2013), reported that the prevalence of patients’ alcohol-drinking problems ranged from 5.7% to 19.2% in Taiwan. Many countries have been implementing policies to reduce the harmful effect of alcohol such as increasing the public awareness of the harmful effect of alcohol, imposing taxation on alcohol, regulating the marketing of alcoholic beverages and restricting the availability of alcohol. Yet, with the millions of deaths per year caused by the harmful use of alcohol, the alcohol regulation policies seem to be fruitless. The core issue is, if people are happy with their consumption of alcohol, it is difficult to convince them not to trace their happiness.

To make the policies of regulating the consumption of alcohol effective, it is important to understand the relationship between happiness and the consumption of alcohol. This paper examines the association between happiness and the consumption of three types of alcohol (Beer, Wine and Spirits) with a fixed effect panel data model using global data from 2010 to 2015. The rest of the paper is organized as follows. Section 2 provides the literature review. Section 3 describes the model, methodology and data. Section 4 provides the empirical result and discussion. Finally section 5 is the conclusion and policy suggestion.

2. Literature Review

After decades of development, happiness data are now available in aggregate level measures as subjective wellbeing of a society. The most comprehensive data set comes from World happiness report. Dolan et al. (2011) recommended that happiness data to be used to formulate public policies since subjective wellbeing were closely related to a basket of variables such as social relationship, life expectancy, positive affects, negative affects and income.

Many studies have reported that drinking are closely associated with social relationship, income and health issues which are important factors of happiness. Lin et al. (2017) found that alcohol-drinking behaviors were related to six major patterns: family habits, leisure activities with friends, work pressures, personal taste, a way to forget one's problems and to express happiness. Cooper et al. (1995) developed the motivational model of alcohol use based on the regulating of positive and negative emotions. Parackal et al. (2017) showed that measurements of happiness could explain the global implication of alcohol. Mason and Spoth (2011) found the association between adolescence alcohol involvement and subjective wellbeing. Beattie and Longabaugh (1997) found that subjective wellbeing of alcoholism increased by one standard deviation after controlling for the addiction to alcohol.

As the taking of alcohol is always accepted as a way to enhance socialization, it is easy to ignore the harmful impact of alcohol. Tkach and Lyubomirsky (2006) studied happiness strategies in everyday life and identified that going to bar and drinking alcohol with friends as one of the factors to increase happiness. Beccaris et al. (2012) reported the association between quality of life and alcohol consumption among young adults in Europe. Livingston et al. (2010) showed that friends and family had adverse impact on the decision of an individual to consumption of alcohol. Casswell et al. (2010), found that addiction to alcohol were closely related to the social relationship with family. Peer alcohol consumption is one of the important factors for young adolescents to drink. Jones and Magee (2014) showed that Australian adolescent's alcohol consumptions were associated with family, friend and peers. Kelly et al. (2012) reported that peer alcohol use influenced the drinking behavior of young adolescents.

3. Model, Methodology and Data

Set point theory puts forward the hypothesis that people have a subjective wellbeing set point which defines normality. The set point varies across individual in different society. Cummins (2009) pointed out that as daily life events caused subjective wellbeing to deviate from the set point, a homoeostasis mechanism would activate to restore the subject wellbeing set point. Consider drinking as a tool to trigger the homoeostasis mechanism, the consumption of alcohol should be associated with factors that affect the subject wellbeing of the society. This paper proposes a linear model for the demand for alcohol.

Consumption of alcohol = Drinking culture + β_0 + β_1 Happiness + β_2 Social support + β_3 Health + β_4 income + β_5 Positive emotion + β_6 Negative emotion + Random error

Converted the model into a Fixed effect model with country aggregate data

$$Calc_{it} = \alpha Z_i + \beta_0 + \beta_1 Happ_{it} + \beta_2 Social_{it} + \beta_3 Life_{it} + \beta_4 GDP_{it} + \beta_5 Positive_{it} + \beta_6 Negative_{it} + \varepsilon_{it}$$

Where

- Calc is demand for alcohol, Happ is life evaluation which is a proxy for happiness, life is life expectance which is a proxy for health, GDP is a proxy for income, Positive is positive affect which is a proxy for positive emotion and Negative is negative affect which is a proxy for negative emotion.
- i represents the individual country with $i=1 \dots N$
- t represents time period with $t=2010 \dots 2015$
- Z is the individual country fixed effect which depends on the drinking culture of individual (i) country but do not vary over time in the estimated period (2010 to 2015)
- β_0 is the intercept and is independent of i and t
- β_1 to β_6 are the slopes which are independent of i and t
- ε_{it} is the random error that varies over i and t

The estimation issue of the fixed effect model is that the drinking culture Z captures the individual unobserved heteroscedasticity and can be correlated with the independent variables such as happiness, income or social support. To take away the unobserved fixed effect, this paper uses the mean subtraction transformation of the model that is subtracted the mean of each variable and estimated the model with panel least square. Under this transformation of the fixed effect model, the individual intercepts are uncorrelated with random error and consistency does not require. One of the drawback for the fixed effect model is that the unobserved individual specific variable may be uncorrelated with the independent variables. As a robust test, this paper performs the redundant fixed effects test, cross section F and cross section Chi-square are estimated.

The data for alcohol consumption comes from world health organization, global information system on alcohol and health. The data records pure alcohol in liter consumption per capita of the general public with age 15 or above at country level for 144 countries during a calendar year. The beverage type involves Beer, Wine and Spirits. This paper uses the data recorded from 2010 and updated in May 2018.

The happiness data comes from world happiness report 2018 which records the data from 156 countries between the years 2010 to 2017. This paper uses the following six variables in the measurement of subjective well-being.

Factors	Variables	Descriptions
Life happiness evaluations	HAPP	Measured as the National-level average scores for subjective well-being, by answers to the Cantril ladder of valuing lives today on a 0 to 10 scale (the worst possible life is 0 and the best possible life is 10).
Positive affect	POSITIVE	Positive affect which is measured as the average of previous-day affect measures for happiness, laughter and enjoyment.

Negative affect	NEGATIVE	Negative emotion which is measured as the average of previous-day affect measures for worry, sadness and anger.
GDP per capita	GDP	Log GDP per capita is in terms of Purchasing Power Parity (PPP) adjusted to constant 2011 international dollars, taken from the World Development Indicators (WDI) released by the World Bank in November 2014.
Social support	SOCIAL	Social support measured by having someone to count on in times of trouble is the national average of the binary responses to the question “If you were in trouble, do you have relatives or friends you can count on to help you whenever you need them, or not?”
Life expectancy	LIFE	Healthy life expectancy at birth is constructed based on data from the World Health Organization (WHO) and the World Development Indicators (WDI).

Mapping the alcohol data with the happiness data, this paper involves 6 periods ranging from 2010 to 2015.

4. Empirical results and Discussion

Dependent Variable: WINE Method: Panel Least Squares Sample: 2010 2015 Periods included: 6 Cross-sections included: 109 Total panel (unbalanced) observations: 646				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
HAPP	0.284776**	0.086358	3.297630	0.0010
GDP	-0.000265	0.101940	-0.002604	0.9979
POSITIVE	-1.341107*	0.641510	-2.090548	0.0370
NEGATIVE	1.787920*	0.711073	2.514398	0.0122
SOCIAL	1.641818*	0.717857	2.287111	0.0226
LIFE	0.049966**	0.016005	3.121811	0.0019
Redundant Fixed Effects Tests: Cross-section F 18.967461** Cross-section Chi-square 1021.056**				
Note: ** significant at 1% * significant at 5%				

The above tables show the relationship between the consumption of wine and the happiness factors for 109 countries with 646 unbalance observations. The consumption of wine is significantly correlated with life evaluation of happiness, positive affect, negative affect, social support and life expectancy. The redundant fixed effect tests show that the fixed effect is not redundant. However GDP does not correlated with the consumption of wine, increase in income does not promote the consumption of wine. The empirical result shows that as people feel happy about their life, they will increase their consumption of wine. If people are in a negative mood, they will reduce the consumption of wine. Social support is an important factor for people to increase the consumption

of wine. As people are expected to live longer, perhaps because of the improvement in the health care system, people will increase the consumption of wine. However, positive mood will cause people to reduce the consumption of wine.

Dependent Variable: BEER				
Method: Panel Least Squares				
Sample: 2010 2015				
Periods included: 6				
Cross-sections included: 111				
Total panel (unbalanced) observations: 653				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
HAPP	0.012278	0.078923	0.155564	0.8764
GDP	0.379972**	0.099603	3.814872	0.0002
POSITIVE	-0.965613	0.548474	-1.760545	0.0789
NEGATIVE	-1.603051**	0.652307	-2.457511	0.0143
SOCIAL	5.371724**	0.642377	8.362261	0.0000
LIFE	0.035622**	0.014490	2.458354	0.0143
Redundant Fixed Effects Tests:				
Cross-section F 14.374123**				
Cross-section Chi-square 897.021934**				
Note: ** significant at 1%; * significant at 5%				

The above tables show the relationship between the consumption of beer and the happiness factors for 111 countries with 653 unbalance observations. The consumption of beer is significantly correlated with GDP, negative affect, social support and life expectancy. The redundant fixed effect tests show that the fixed effect is not redundant. However life evaluation of happiness and positive mood do not correlated with the consumption of beer. The empirical result reviews that as income increases, people will increase their consumption of beer. Social support is an important factor for people to increase the consumption of beer. A long life expectancy causes people to increase the consumption of beer. However people reduce the consumption of beer under negative mood.

Dependent Variable: SPIRIT				
Method: Panel Least Squares				
Sample: 2010 2015				
Periods included: 6				
Cross-sections included: 109				
Total panel (unbalanced) observations: 646				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
HAPP	-0.078017	0.086051	-0.906636	0.3650
GDP	0.050502	0.115369	0.437742	0.6618
POSITIVE	-3.393620**	0.577522	-5.876169	0.0000
NEGATIVE	-3.299445**	0.708998	-4.653674	0.0000
SOCIAL	2.280811**	0.662108	3.444773	0.0006
LIFE	0.044018**	0.019695	2.235002	0.0258
Redundant Fixed Effects Tests:				
Cross-section F 17.269916**				
Cross-section Chi-square 973.429565**				
Note: ** significant at 1%; * significant at 5%				

The above tables show the relationship between the consumption of spirit and the happiness factors for 109 countries with 646 unbalance observations. The consumption of spirit is significantly correlated with positive affect, negative affect, social support and life expectancy. The redundant fixed effect tests show that the fixed effect is not redundant. However life evaluation of happiness and GDP do not correlated with the consumption of spirit. The empirical result reviews that social support is an important factor for people to increase the consumption of spirit. A long life expectancy causes people to increase the consumption of spirit. However people reduce the consumption of spirit under positive and/or negative mood.

5. Conclusion

In most of the cases, both positive and negative emotions reduce the consumption of alcohol. This may due to the fact that alcohol stimulates the mood factor and causes people's emotion to swing away from the emotional set point. As people are in positive or negative mood, the self-correction system tends to help people to swing the emotion back to the set point. One way is to reduce the consumption of alcohol so as to reduce the stimulate effect of alcohol.

All three types of alcohol are significantly associated (positive) with social support and life expectance. The empirical result shows that social support including friendship, family and working relationship, needs the consumption of alcohol as a complementary element to cultivate the social relationships. As alcohol is expected to create a mood factor to provide a better communication environment which is important for the development of social relationship. For the three types of alcohol, the coefficient between beer and social support is the largest. Beer contains the lowest percentage of alcohol and is normally cheaper than wine and spirit. With the marketing effect of drinking beer as a symbol of friendship, beer is usually considered to be an essential element for gathering events such as party, celebration and family gathering. Since social support is an important happiness element, it seems that happiness tends to encourage the increase in consumption of alcohol especially beer. To discourage the consumption of beer, policy can target on reducing the friendship or relationship symbolic effect of beer by advertising or other public relationship strategies. Moreover, the imposition of beer tax can be useful since beer is the only type of alcohol that is positively associated with GDP.

The empirical result shows that increases in life expectancy will increase the consumption of alcohol. As the health care system improves, the adverse effect of consuming alcohol tends to be neutralized. People become happier to consume more alcohol. However, this creates a negative externality for the society because the social expenditure on deceases relating to the over consumption of alcohol increases. Indeed it is not so happy even your life is longer but suffer from the deceases relating to the over consumption of alcohol. To handle this issue, government should educate people about the heath adverse effect of over consumption of alcohol.

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