

# ALCOHOL CONSUMPTION AND CRIME INCIDENCE IN THE PHILIPPINES

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## ABSTRACT

Most police reports about crime incidence are attributed to alcohol drinking. With this conviction, it is imperative to investigate the determinants of alcohol consumption and examine how alcohol consumption affects crime incidence in the Philippines. The study employed cross-sectional data and panel data in the estimation. There is an upward trend in the consumption of alcohol from 2004-2012. Results in the estimation showed that among the determinants of alcohol consumption, food expenditure, wear expenditure, educational expenditure, income and age, significantly explain the changes in alcohol consumption in the Philippines. On the other hand, alcohol consumption significantly affects the changes in murder and physical injury. Although there is a close relationship between alcohol and crime, the impact of alcohol as a cause of crime should be seen in the context of other causal factors.

Keywords: alcohol consumption, crime incidence, panel data estimation

## INTRODUCTION

### BACKGROUND OF THE STUDY

Alcohol is associated with general anti-social behavior affecting people's general quality of life. According to World Health Organization (WHO) alcohol is clearly a popular good because they estimated that there are some 2 billion alcohol consumers. While most consumers enjoy alcohol in moderation, some consumers consume heavy alcohol and act unprofessional especially when they drink too much without knowing that it is associated with negative health and social outcomes. It has been acknowledge that the enjoyment of alcohol consumption may lead to the consumer a potential for negative outcomes (Fogarty, 2008). Since using alcohol is legal and persistent, it plays a strong role in the relationship to crime and other social problem (National Council on Alcoholism and Drug Dependence, Inc., 2015).

In the Philippines, the most popular drink is beer, followed by lambanog (whiskey made from coconut) and wine ([www.alcoholrehab.com](http://www.alcoholrehab.com)). Beer is the common part of birthdays, fiestas and other parties. Even when there is no occasion, many Filipinos still hang out together anywhere like in the streets, bar, in front of their houses and convenience stores drinking gin and tonic which is also consider as a cheaper alcoholic drink. Alcoholism is a growing concern in the culture and social life of Filipinos. A number of cases of sexual and drug abuse, suicide and violence among Filipinos is usually due to drunkenness or alcohol intoxication (Valbuena, 2006).

The Philippine National Police reported that in the year 2015 the number of reported crimes in the Philippines increased by 46% in the first 5 months compared to the same period the previous year (Ranada, 2016).

The study of alcohol consumption among residents of a developing economy may be of particular interest because, as others have argued, the lower levels of both income and education may make the average consumers in those countries more sensitive to changes in prices than the average consumers in economies with higher levels of income and education (Swahn *et al.*, 2013). According to Family Income and Expenditure Survey (FIES) and National Economic Development Authority (NEDA) 2004, an average Filipino family spends 1% of their income on alcoholic beverages (Labajo, 2010). But, if a person develops the habit of drinking for at least three bottles of beers every night, and his or her minimum wage is \$5 a day, that would mean that spending 1% a day on beer is already 20% of his earned money (Valbuena, 2013).

In the Philippines, alcohol plays a large role in criminal activities and violence. Excessive drinking has the ability to lower self-consciousness, impair a person's judgment and increase the risk

of aggressive behaviors. Because of this, alcohol-related violence and crime rates are high throughout the country ([www.alcoholrehab.com](http://www.alcoholrehab.com)).

### **Rationale of the Study**

According to World Health Organization, alcohol consumption is declining in most developed countries like Japan, Canada, United States, Australia and other improved or industrialized countries but rising in many of the developing countries like India, Iraq and other countries with a less developed industrial base including Philippines. The global burden of alcohol use over all countries was estimated to be 4% of the total disability adjusted life years lost, which makes it more damaging than tobacco at 2.6%. Alcohol causes 1.8 million annual deaths (3.2% of total worldwide, with 80% of this excess mortality occurring in the developing regions of the world (Tian and Liu, 2011).

Violence is of particular interest because of the mental and physical harm it inflicts on others. The victims, often well known to the executor, include spouses, children, and friends. Alcohol is frequently a factor in such violence. When the victim is the offender's spouse, alcohol is a factor as much as 75 percent of the time. Alcohol consumption is cited also as a common correlate of violence committed by teenagers. Although the two behaviors often are observed together, much is still unknown about their association (Markowitz, 2001).

Alcohol abuse is a problem in the Philippines. The World Health Organization sounded the alarm over the harmful use of alcohol which killed 3.3 million people globally in 2012. In 2015, Filipinos are known to be the second highest consumers of alcohol in South East Asia after Indonesia, and number one in terms of wine drinking (Cruz, 2015). Alcoholic beverages have been a part of social life for millennia, yet societies have always found it difficult to understand or restrain their use. A central theme of this study is that to better understand alcohol consumption and its consequences.

### **Objectives of the Study**

The general objective of the study is to estimate the relationship of alcohol consumption and crime incidence in the Philippines. Specifically, this study aims;

1. To present the trend of alcohol consumption and different crime incidence in the Philippines;
2. To determine how household characteristics affect alcohol consumption; and
3. To determine the relationship between alcohol consumption to crime incidence in the Philippines.

### **Significance of the Study**

From a policy perspective, understanding the nature of relationship of alcohol and crime is important. If alcohol consumption does indeed lead to violent behaviors, then it may be possible to reduce violence through changes in policies that affect the demand for alcohol (Markowitz, 2001).

Having information about the connection between alcohol consumption and crime has led many to suggest possible methods of reducing consumption with the intention that in return this reduces the problems including criminal behavior associated with alcohol. Any initiative which decreases total absolute alcohol consumption can be expected to have a beneficial effect on alcohol related crime (Mason and Wilson, 1989).

### **Scope and Limitation**

This study focused on finding the relationship between alcohol consumption and crime incidence in the Philippines in year 2012. The study used cross-sectional data in measuring consumption for individuals or groups gathered from Family Income and Expenditure Survey (FIES). Panel data was also used in measuring crime and alcohol including the control variables. Data of crime was taken from the Philippine Statistical Yearbook a publication of the Philippine Statistics Authority (PSA).

## METHODOLOGY

### THEORETICAL FRAMEWORK

The standard neoclassical approach of microeconomics defines the substitute goods by measuring the consumption through called utility. Substitute goods are goods that can be used in activities aimed to satisfy the same needs, in one place of another. An interesting mainstream definition of substitute goods relates this property to elasticity, more specifically cross-price elasticity. Say for instance, the quantity reaction in the sales of one good to changes in the price of the other. If the sign of this elasticity is positive, an increase of price produces an increase of quantity purchased of the former good. This is what happens when two goods are compared and the price change makes the other good relatively cheaper. In short, in this perspective, two goods are substitutes if cross-price elasticity is positive (Piana, 2005).

Microeconomic theory also talks about the negative income effect which is the case of inferior goods. Inferior good is a type of good whose demand declines when income rises. In other words, demand of inferior goods is inversely related to the income of the consumer ([www.economictimes.com](http://www.economictimes.com)). In economics, an inferior good is one for which the income elasticity of demand which is how much you change your demand for the good in response to a change in your income is negative. In other words, you will buy less of an inferior good when your income increases and more of it when your income goes down (Courtois, 2009)

A person's level of income may influence how much a person consumes alcoholic beverages. Income level may influence a person's drinking habits' and people with lower income are light drinkers, non-drinkers, and heavy drinkers, while people with higher income are more likely to drink overall, but they are also more likely to drink moderately. Media reports alluding to the idea of the middle-class professionals who drink with alarming regularity to levels of excess. Consistent consumption of relatively large quantities of alcohol has increased as alcohol has become increasingly available and affordable over time ([www.ias.org.uk](http://www.ias.org.uk)).

Alcohol is commonly consumed around mealtimes because of its ethanol that has the potential to modify food intake and it control the fatty acid oxidation. The food-alcohol competition study concludes that the more processed or sweet high fat foods consume the more people drink alcohol (Zapolski *et al.*, 2014).

From the theoretical point of view, there are two views in explaining the relationship between crime activities and economic growth. The first one is that criminologists believe that tough economic times make people more willing to commit crimes and the second one is that Economists believe that better economic times increase crime (Klaer, 2014).

Income inequality and the incidence of crime has been an important subject of study since the early stages of the economics literature on crime and has also been the subject of sociological theories on crime. The feeling of disadvantage and unfairness leads the poor to do things to seek compensation and satisfaction by all means, including committing crimes against both poor and rich. Income inequality, measured by the Gini index, has a significant and positive effect on the crime incidence (Fajnzylber, 2002).

Criminal activity and the unemployment rate are hypothesized to have a positive relationship. The idea is that those without a steady income are more likely to commit crimes than those with a steady income. Lower economic status, specifically higher unemployment leads to higher crime rates in both property and crime (Ajmotokin *et al*, 2005). There is a positive correlation between the crime rate and poverty. Poverty is a relative concept and depends on the overall standard of living in the society. It has also a huge psychological influence on people, who become depressed, desperate and then decide to commit a crime as if nothing was found that can get them out of such situation (Huang *et al*, 2003).

Overseas research supports the hypothesis that there is, at the very least, a relationship between alcohol and the commission of criminal offences. However, although there is a close relationship between alcohol and crime, the use of alcohol alone, explains very little, whereas considering alcohol use in combination with other variables can account for a substantial proportion of criminal behavior. Obviously, there is much crime that is not committed under the influence of alcohol

and many persons who drink, and even abuse alcohol, do not commit criminal offenses (Mason and Wilson, 1989).

### Conceptual Framework

There are two process of estimation in order to determine the relationship of the variables used. The first part of this study measures the characteristics of households that determine alcohol consumption; these are age, gender, marital status, family member, food expenditure, income, wear expenditure, educational expenditure and transport cost as shown in Figure 2. The next phase is the estimation of the effect of alcohol consumption and control variables to crime incidence. The control variables used in this study are unemployment, poverty, GRDP and Gini coefficient (Figure 3).

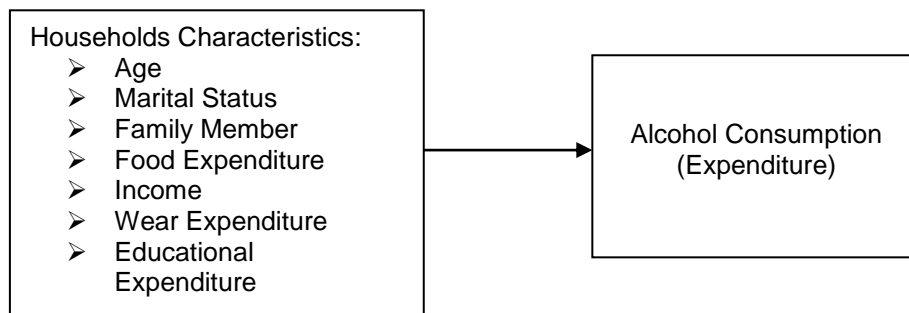


Figure 2.Characteristics of the households that determines alcohol consumption.

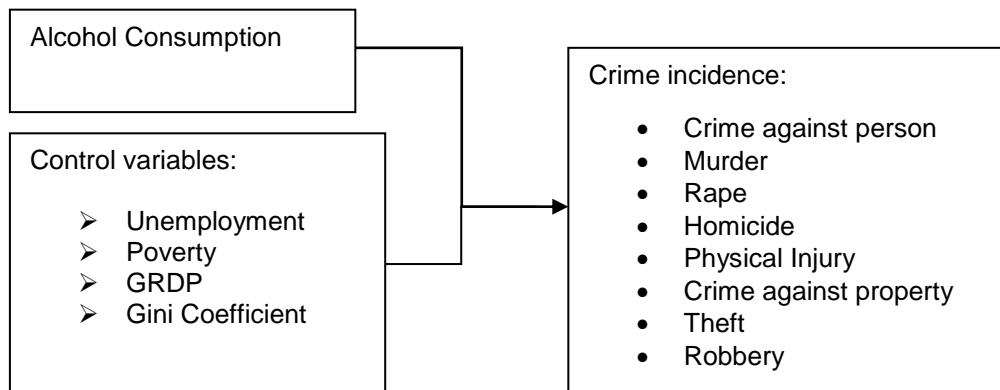


Figure 3.The effect of alcohol consumption to crime incidence.

### VARIABLES OF THE STUDY

- Age –refers to the age of the household head who consumed alcohol, measured by years from birth.
- Family Member- refers to the number of members present in the family (PSA).
- Marital Status- refers to the status of an individual in relation to marriage classified as married, divorced, separated and widowed (PSA).
- Food Expenditure - refers to the expenses that the household spent for their food in peso (Php).
- Income- refers to the money that an individual or business receives in exchange for providing a good or service or through investing capital (Investopedia)

- Wear Expenditure - refers to the amount in peso that the household spent for their clothes.
- Educational Expenditure - refers to the expenses that the household head spent for their children in peso.
- Murder - The crime of unlawfully killing a person especially with malice. This refers to the number of people who commit murder.
- Rape – refers to the crime of using force or the threat of force to compel a person to submit to sexual intercourse. This refers to the number of people who commit rape.
- Homicide - homicide is broader in scope than murder. It refers to an act of killing another person.
- Physical Injury - refers to the number of people who injure a person's body.
- Theft- refers to the crime in which a person intentionally takes personal property of another without permission or consent ([www.legaldictionary.com](http://www.legaldictionary.com))
- Robbery – refers to the number of people who unlawfully taking the property of another by the use of violence or intimidation.
- Alcohol consumption – refers to the drinking beer, wine, or distilled spirits such as gin, whiskey, or vodka, that contains ethyl alcohol ([www.diet.com](http://www.diet.com)).
- Unemployment - refers to a phenomenon that occurs when a person who is actively searching for employment is unable to find work ([www.investopedia.com](http://www.investopedia.com)).
- Poverty- refers to not having enough money to meet basic needs including food, clothing and shelter (Economics and Social Inclusion Corporation).
- GRDP- refers to the aggregate of gross value added (GVA) of all resident producer units in the region (PSA).
- Gini Coefficient- a measure of the extent to which the distribution of income or expenditure among families or individuals deviates from a perfectly equal distribution, with limits 0 for perfect equality and 1 for perfect inequality (PSA).

## **DATA SOURCE**

This study used secondary data from the Family Income Expenditure Survey (FIES) 2012 and Philippine Statistics Authority (PSA). Cross-sectional data of households from FIES were used in the first estimation of alcohol consumption determined. On the other hand, panel data was used in the relationship of crime and alcohol consumption.

## **Statistical Analysis**

The study is divided into three parts: (i) the first part presents the trends of alcohol consumption and crime; (ii) the second part is the estimation of the relationship of alcohol consumption and household characteristics; and (iii) the last part is the testing of relationship between alcohol consumption and crime.

### **A. Trend of Alcohol Consumption and Crime in the Philippines**

Descriptive analysis is used to determine the trends of alcohol consumption and crime in the Philippines. Microsoft Excel 2007 was employed to create a graph to visualize the behavior of the variables.

## B. Relationship of Alcohol Consumption and Household Characteristics

Ordinary Least Squares (OLS) is a tool used to examine two or more interval variables. This study used the OLS to determine the relationship of the household characteristics and alcohol consumption. This method possesses the goal of minimizing the sum of the squares of the differences between the observed responses in the given dataset. In order this model to become Best Linear Unbiased Estimator (BLUE), these assumptions must be enclosed which are:

1.  $E(\varepsilon_t) = 0$   
This implies that the mean of the error term is zero.
2.  $E(\varepsilon_t^2) = \text{var}(\varepsilon_t) = \sigma^2$   
This is the property of homoscedasticity, i.e. that the errors have a common variance.
3.  $\text{Cov}(\varepsilon_t, \varepsilon_s) = 0$  where,  $(t \neq s)$

This is the property of no autocorrelation, i.e. no two errors are serially correlated.

There may be problems to be encountered such as Multicollinearity, Heteroscedasticity and Autocorrelation. If one of these assumptions is violated then it will no longer be Best Linear Unbiased Estimator (BLUE).

To estimate the coefficients  $\beta_0, \beta_1, \dots, \beta_6$ , regression analysis for a cross-section of different regions were used. Regression analysis was used to estimate the relationship between variables. The statistical technique determined the effect of the independent variable to dependent variables, holding other factors constant. In this model, crime is the dependent variable while other factors were considered to be independent variables including alcohol consumption.

## C. Relationship of Alcohol Consumption and Crime

The study analyzed the panel data in two ways. First, fixed effect (FE) was used in analyzing the impact of variables that vary over time. It assumes that there may be a bias or impact in the predictor or outcome variables when using FE model. Another important assumption of the FE model is that those time-invariant characteristics are unique to the individual therefore it should not be correlated with other individual characteristics as well as the entity's error term and the constant. If the error terms are correlated, then FE is not appropriate since assumption is not correct. Second is the random effects, in which there is a need to specify the individual characteristics that may or may not influence the predictor variables. The assumption of random effect is that the entity's error term is not correlated with the predictors which allows for time-invariant variables to play a role as explanatory variables. The rationale behind random effects model is that, unlike the fixed effects model, the variation across entities is assumed to be random and uncorrelated with the predictor or independent variables included in the model (Reyna, 2007).

The generally accepted way of choosing between fixed and random effects is running a Hausman test. The Hausman test checks a more efficient model against a less efficient but consistent model to make sure that the more efficient model also gives consistent results. Statistically, fixed effects are always a reasonable thing to do with panel data (they always give consistent results) but they may not be the most efficient model to run. Random effects will give you better P-values as they are a more efficient estimator, so you should run random effects if it is statistically justifiable to do so. The Hausman test tests the null hypothesis that the coefficients estimated by the efficient random effects estimator are the same as the ones estimated by the consistent fixed effects estimator. If they are (insignificant P-value, Prob>chi2 larger than .05) then it is safe to use random effects. If you get a significant P-value, however, you should use fixed effects (Stock and Watson, 2003).

## EMPIRICAL MODEL

### Alcohol Consumption and Household Characteristics

To obtain the measurement in consumption of alcohol and household characteristics cross-sectional data were used.

$$AC_{it} = \beta_0 + \beta_1 FEX_{it} + \beta_2 WEX_{it} + \beta_3 TR_{it} + \beta_4 EDEX_{it} + \beta_5 INC + \beta_6 FMEM_{it} + \beta_7 A_{it} + \beta_8 MS_{it} + \varepsilon_{it} \quad (1)$$

where:

|               |  |
|---------------|--|
| AC            | = Alcohol Consumption (in pesos) in region <i>i</i> at year <i>t</i> ;                                     |
| FEX           | = Food Expenditure (in peso) region <i>i</i> at year <i>t</i> ;  |
| WEX           | = Wear Expenditure (in peso) region <i>i</i> at year <i>t</i> ;  |
| TR            | = Transportation Cost (in peso) region <i>i</i> at year <i>t</i> ;   |
| EDEX          | = Education Expenditure (in peso) region <i>i</i> at year <i>t</i> ;                                       |
| INC           | = Income (in peso) region <i>i</i> at year <i>t</i> ;  |
| FMEM          | = Family Member in region <i>i</i> at year <i>t</i> ;  |
| A             | = Age of household in region <i>i</i> at year <i>t</i> ;   |
| MS            | = $\begin{cases} 1, & \text{if the } i\text{th household is married} \\ 0, & \text{otherwise} \end{cases}$ |
| $\varepsilon$ | = error term   |

### Relationship between Alcohol Consumption and Crime

To examine the relationship between alcohol consumption and crime incidence, panel data also known as longitudinal or cross-sectional time-series data was used in this study in which the behavior of entities are observed across time.

Panel data analysis has become a popular tool for researchers in public policy and public administration. Combining information from both spatial and temporal dimensions, panel data allow the repeated observations of the same units, and could increase both quantity and quality of the empirical information (Zhu, 2012).

$$CR_{it} = \beta_0 + \beta_1 AC_{it} + \beta_2 UE_{it} + \beta_3 P_{it} + \beta_4 GRDP_{it} + \beta_5 GC_{it} + \varepsilon_{it} \quad (2)$$

where:

|                    |  |
|--------------------|--|
| CR                 | = Crime incidence in region <i>i</i> at year <i>t</i>                            |
| AC <sub>it</sub>   | = Alcohol Consumption in peso in region <i>i</i> at year <i>t</i>                |
| UE <sub>it</sub>   | = Unemployment rate in region <i>i</i> at year <i>t</i>                          |
| P <sub>it</sub>    | = Poverty threshold in region <i>i</i> at year <i>t</i>                          |
| GRDP <sub>it</sub> | = Gross Regional Domestic Product per capita in region <i>i</i> at year <i>t</i> |
| GC <sub>it</sub>   | = Gini Coefficient per capita in region <i>i</i> at year <i>t</i>                |
| $\varepsilon$      | = error term   |

### Estimation Procedure

STATA Version 13.0 which is the econometric model for estimation of model, statistical analysis, data management, and regression was used to estimate and test the significance of the parameters. Microsoft Excel 2007 were utilized for feature calculation and graphing tools.

## RESULTS AND DISCUSSION

### Trend Analysis

Figure 4 shows the regional alcohol consumption in the Philippines from 2004-2012. From 2004 to 2012, alcohol consumption has increase in all regions. Ilocos region showed the highest alcohol consumption among all regions followed by Bicol, MIMAROPA and CARAGA region has the lowest alcohol consumption. The lowest alcohol consumption among all regions is Cagayan Valley. Drinking in the Philippines has always been a staple to every celebration. May it be in a birthday party, a *fiesta*, or just a simple get-together. Filipinos especially those who live in a rural areas have their own special wines which they drink on special occasions like *tapey* in the Mountain Province, *lambanog* in Quezon Province, *laksoy* in Southern city of Butuan in Mindanao and *basi* in northern region of Ilocos (Caballar, 2016)

Ilocos region is known to have a lot of festivals. Actually, there are 22 festivals celebrated in a year including *Bac-Bacarra* festival, *Amian* festival, Empanada festival and many more to strengthen cultural awareness and appreciation, as well as to promote local tourism (Vigan City Council, 2014). Since drinking is a vital part of Filipino culture especially with these kind of celebrations, therefore the consumption of alcohol in Ilocos region was high and continuously increase.

Figure 5 presents the regional murder incidence in the Philippines from 2004 to 2012. It shows that in 2012, Bicol region has the highest murder incidence in the Philippines followed by Ilocos region and National Capital Region. Aside from 2012, the murder incidence mostly increased in the year 2009 and Bicol region has the highest murder incidence followed by Eastern Visayas and National Capital Region. Cagayan Valley has the lowest murder incidence in year 2009.

Figure 6 presents the regional physical injury incidence in the Philippines from 2004 to 2012. It is clearly shown in the graph that in 2009, the highest physical injury incidence happened in all regions. Among all regions, MIMAROPA has the highest incidence of physical injury followed by Ilocos region and Eastern Visayas. The lowest incidence was recorded in CARAGA region. The drastic increase of incidents in 2009 was due to the new computational procedure of PNP, when they have included minor cases such as Barangay blotters and filed cases (Philippine Statistics Authority, 2012).

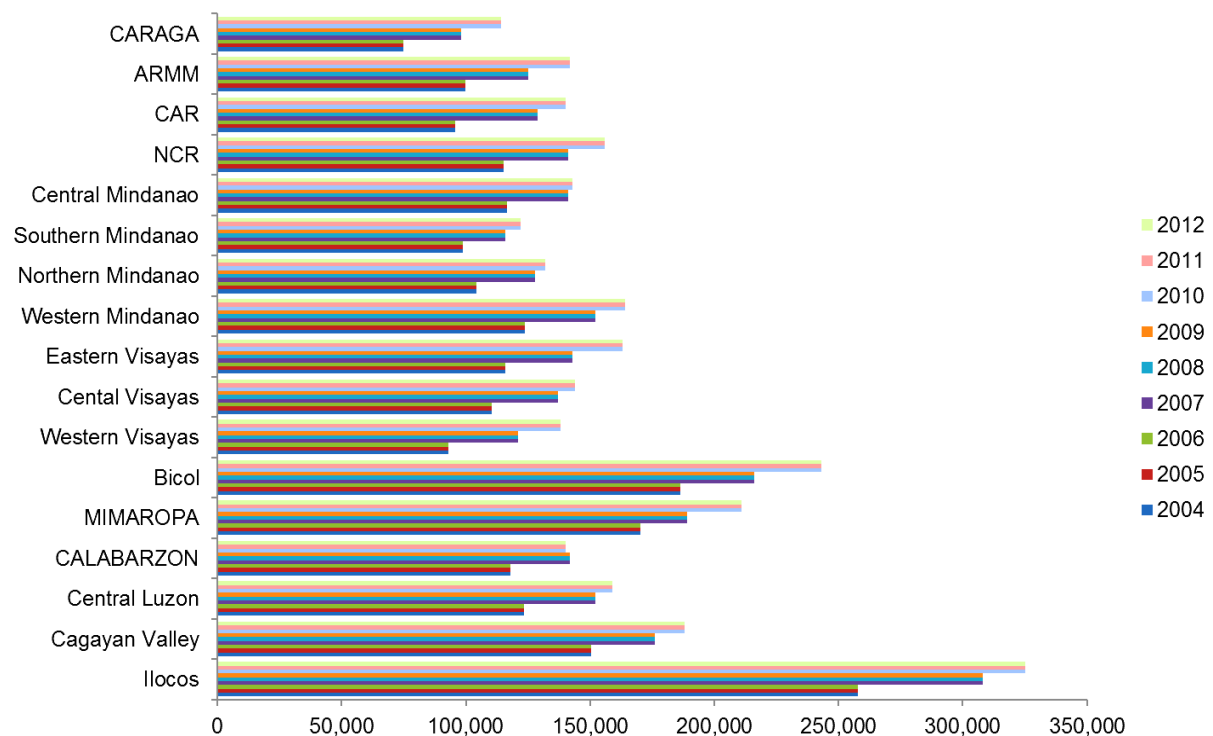


Figure 3. Alcohol consumption expenditure by region in the Philippines, 2004-2012.  
Source: Philippine Statistics Authority (PSA)



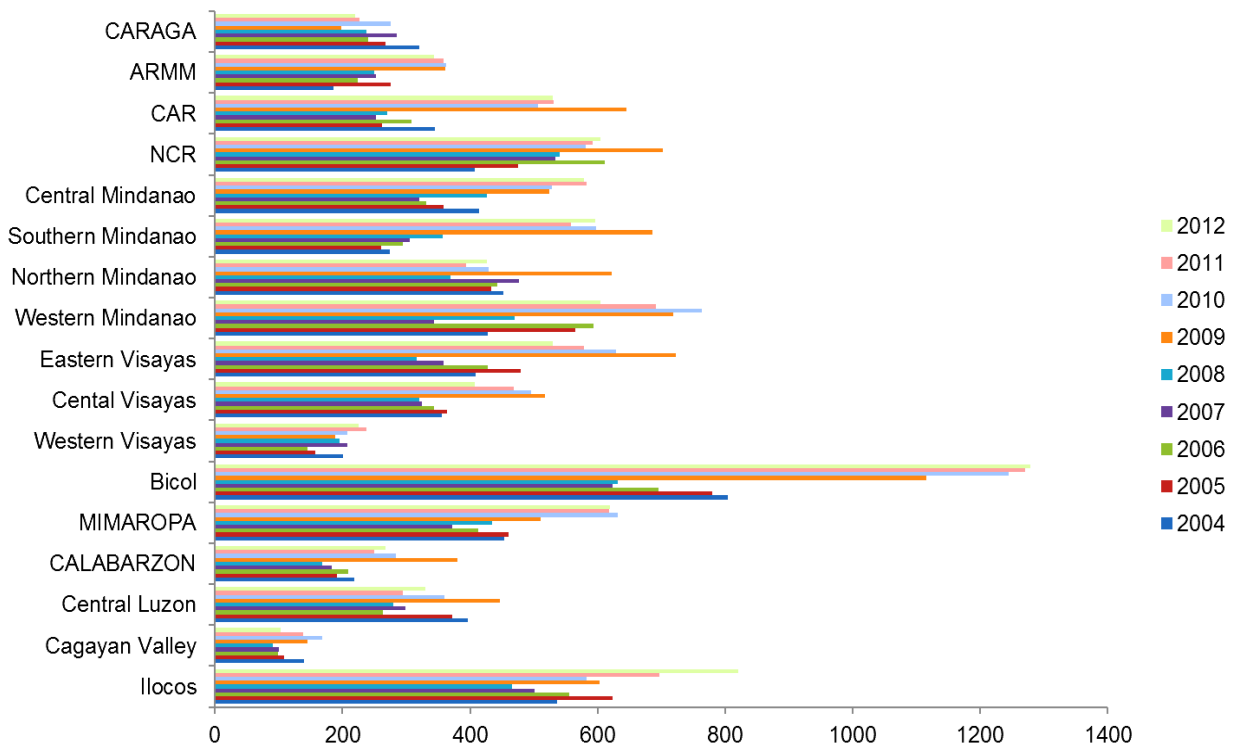


Figure 4. Regional murder incidence in the Philippines, 2004-2012.  
Source: Philippine Statistics Authority

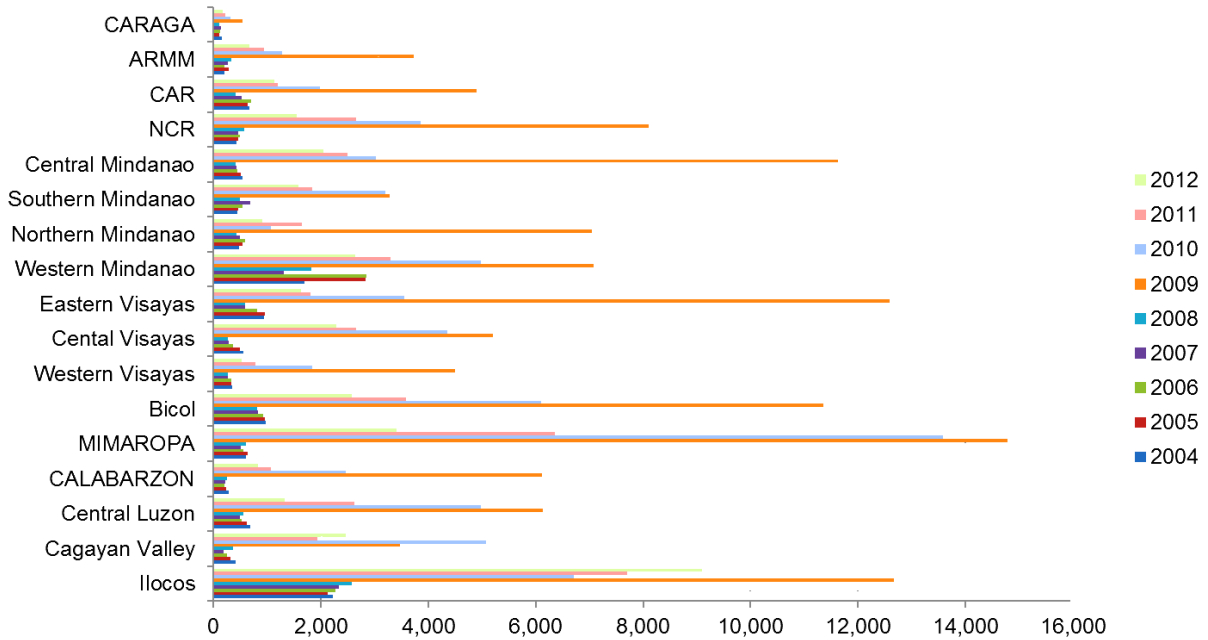


Figure 5. Regional physical injury in the Philippines, 2004-2012.  
Source: Philippine Statistics Authority

## Relationship of Alcohol Consumption and Household Characteristics

Table 1 presents the parameter estimates of the household characteristics of alcohol in the Philippines. Food expenditure, wear expenditure, educational expenditure, income and age showed a significant relationship to alcohol consumption. A 1% increase in educational expenditure and income will lead to a decrease in alcohol consumption by 0.03% and 0.33%. A negative sign between income and alcohol means that alcohol is an inferior good. This implies that as income increases the consumption of alcohol decreases, in which the consumer devotes his/her consumption to normal goods. However, a unit increase in food expenditure and wear expenditure will increase alcohol consumption by 0.79% and 0.14% which means that alcohol is a substitute good. Substitute means that if the price of one good increases, then demand for the substitute is likely to rise, therefore substitute have a positive cross elasticity of demand (Pettinger, 2012). As the price of alcohol increases, the consumption of food and wear expenditure increases. Since there is a positive sign in the estimated coefficient of age this means that the higher the age of the household head, the higher is consumption of alcohol.

Household socio-demographics are important determinants of alcohol purchase decisions and expenditures, and the effects can differ. Results are consistent with the study of Tan *et al.* (2009) that education had a significant but modest impact in reducing the probability of alcohol purchase decisions and expenditure levels.

Alcohol is commonly consumed around mealtimes because of its ethanol that has the potential to modify food intake and it control the fatty acid oxidation. This is constant to the study of Zapolski *et al.* (2014) that the more processed or sweet high fat foods consume the more people drink alcohol.

The higher the age of the household head the higher the alcohol consumed. The reason behind is that older people are most who left or stayed at home since it is not capable enough for their strength to work for so they have more time to drink alcohol with their friends. In other words, household characteristics are one of the factors that affect the level of alcohol consumption.

Table 1. Parameter estimates of the relationship of alcohol consumption and household characteristics.

| Variables | Estimated Coefficient | Standard Error | P-value |
|-----------|-----------------------|----------------|---------|
| foodex    | 0.7968*               | 0.0430         | 0.000   |
| wearex    | 0.1462*               | 0.0142         | 0.000   |
| educex    | -0.0375*              | 0.0050         | 0.000   |
| income    | -0.3379*              | 0.0276         | 0.000   |
| fammem    | -0.0023 <sup>ns</sup> | 0.0086         | 0.790   |
| age       | 0.0038*               | 0.0012         | 0.001   |
| ms        | -0.1146 <sup>ns</sup> | 0.2185         | 0.600   |
| constant  | -1.9258               | 0.4324         | 0.000   |

\*Significant at 5%

ns not significant

Table 2 presents the parameter estimates on the effect of alcohol consumption and control variables to crime in the Philippines. Alcohol consumption has a significant relationship to murder. A 1% increase in alcohol consumption will decrease murder by .005%. Although there is a close relationship between alcohol and crime, the impact of alcohol as a cause of crime should be seen in the context of other causal factors. Clearly, there is much crime that is not committed under the influence of alcohol and many persons who drink, and even abuse alcohol, do not commit criminal offenses (Mason and Wilson, 1989). As stated in the study of alcohol and crime in Korea studied by Lee (2013), not everyone who drinks alcohol becomes violent and even in the case of those who do become violent, the frequency and severity of violence varies according to the occasion.

Physical injury is significant to alcohol consumption. A 1% increase in alcohol consumption will increase physical injury by 0.003%. This is supported by WHO (2007) which stated that people who consumed alcohol were more likely to have suffered an intentional injury or physical injury.

Table 2. Parameter estimates on the effect of alcohol consumption and control variables to crime in the Philippines, 2004-2012.

| Crime Incidents | Constant                 | AC                   | UE                   | P                   | GRDP                | GC                    |
|-----------------|--------------------------|----------------------|----------------------|---------------------|---------------------|-----------------------|
| Murder          | -53.0625<br>(166.558)    | -0.0051*<br>(0.0001) | 3.5479<br>(2.7282)   | 0.0170*<br>(0.0062) | 0.0011*<br>(0.0002) | 362.31**<br>(214.898) |
| Physical Injury | -3433.624<br>(-2000.759) | 0.0026*<br>(-0.0013) | 33.2555<br>(33.2932) | 0.1651<br>(0.1083)  | 0.0193*<br>(0.0027) | 1789.69*<br>(816.200) |

( ) standard error in parenthesis

\*5% significant level

\*\*10% significant level

## SUMMARY AND CONCLUSION

The general objective of the study is to estimate the relationship of alcohol consumption and crime incidence in the Philippines. It also has a presence of control variables to clearly identify and to look for other factors that may affect crime. Profile of regional alcohol consumption and crime incidence in the Philippines from year 2004 to 2012 was also included in this study. Panel data also known as longitudinal or cross-sectional data was used to determine the relationship of alcohol and crime incidents in which the behaviors of entities are observed across time. Stata Version 13 was used to estimate the model.

1. Regional alcohol consumption in the Philippines has been increasing in trend from year 2004 to 2012. Ilocos region has the highest alcohol consumed and CARAGA was the lowest. Drinking alcohol is part of the Philippine culture and is common in birthdays, fiestas and other celebrations and even where there is no occasion, many Filipinos still hang out together.
2. Crime incidence increased in year 2009 due to a new computational procedure made by PNP where they included minor cases such as Barangay blotters and filed cases. It was also observed that rape, homicide and murder incidence was high in Bicol region due to alcohol consumption, and theft and robbery was high in Ilocos region.
3. This study also concludes that alcohol is a substitute good in which consumers will spend alcohol, without depriving the expenditure of wear and food.
4. In relation between crime and alcohol, it was found out that only murder and physical injury has a significant relationship to alcohol consumption which means that alcohol consumption is not a factor to homicide, rape, theft and robbery in the Philippines.

## RECOMMENDATIONS

Based on the result and conclusion in this study, the following recommendations were made:

1. The Philippine National Police should strengthen the policy on crime to promote peace and order in the Philippines.

2. The Department of Health should conduct a seminar and to have extensive information, education and communication (IEC) campaign to spread health bulletins like on social media about the advantages and disadvantages of consuming alcohol.
3. The Department of Finance should include the expanded Valued-added tax to alcohol products.

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