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Is there a link between alcohol consumption and the level of poverty?

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ABSTRACT

In many developing countries, in addition to household income, there are a number of other socio-economic determinants of poverty. One such hidden socio-economic factor is alcohol consumption and some studies argue that there is a link between alcohol consumption and poverty. The main aim of this study is to measure the effects of alcohol consumption on the level of poverty in a systematic way. Using Sri Lanka as a case study, this article demonstrates that the consumption of various types of alcoholic beverages, particularly, the illegal beverages, has a significant positive association with the level of poverty. The findings of this study suggest that, in Sri Lanka, the consumption of illegal alcoholic beverages increases the likelihood of being in a poor household by 2–3%. The results of this study also find that households who are characterized as nonpoor but are just above the poverty line behave more like the poor rather than the nonpoor in terms of alcohol consumption. Some of the conclusions from this Sri Lankan case study can be applied to other developing countries.

KEYWORDS

Alcohol consumption; ordered probit model; poverty; household characteristics

JEL CLASSIFICATION

C21; I32

I. Introduction

Poverty alleviation has become a major priority for national governments and international institutions such as the United Nations (UN) and the World Bank since the setting of Millennium Development Goals (MDGs) in the mid-1990s. Poverty is a multi-dimensional concept and measuring poverty has become a complex and difficult task. Understanding the root causes of poverty is an even more difficult task. Many developing countries (e.g., China, India, Vietnam, Thailand and Malaysia) have attempted to reduce poverty over the last two decades by accelerating economic growth and increasing income levels. However, it is becoming evident that the low level of income of households is not the only contributing factor to poverty and its severity. Other socio-economic determinants of poverty in these countries include lack of assets, landlessness, unemployment or underemployment, illiteracy, malnutrition, poor health condition, high infant mortality, large family size, low productivity, low position in the social hierarchy, low access to publicly provided goods and services, poor infrastructure facilities and extreme vulnerability to natural calamities, disease and social conflicts (Adrian and Ferguson

1987; Sen 1999; Laderchi 2001; Siddhisena and Jayathilaka 2006). Addressing these socio-economic factors has been a challenge that goes beyond just achieving the MDGs.

One such hidden socio-economic factor is alcohol consumption. Some argue that there is a link between alcohol consumption and poverty (Baltagi and Goel 1990; Singer et al. 1992; Hettige 1993; Jones-Webb et al. 1997; Delva and Kameoka 1999; Droomers et al. 1999; Pia 1999; Khan, Murray, and Barnes 2002; Samarasinghe 2006; Pu et al. 2008). The main stream poverty analysts have ignored this link despite the evidence that supports this strong relationship (Holm and Suoniemi 1992; Victorian Alcohol & Drug Association 2003; Chronic Poverty Research Centre 2007; Karnani 2009; Samarasinghe 2009). These studies have failed to analytically measure the impact of alcohol consumption on poverty. Therefore, there is a need to measure the effect of alcohol consumption on poverty in a systematic way in order to design comprehensive poverty reduction strategies beyond the reduction in the aggregate poverty level as stipulated in MDGs, especially, in developing countries. Although there is a large body of literature on various economic determinants of alcohol consumption, not much

attention has been paid to the link between poverty and alcohol consumption. Studies directly dealing with poverty and alcohol consumption are very limited in the literature. Very few studies have discussed the possible effects of alcohol consumption on poverty (Khan, Murray, and Barnes 2002; Neufeld et al. 2005; Jayathilaka 2007). Other studies found that households with increased alcohol consumption and other drug use and related problems have low education and lower income than the households with no problem drinkers (Droomers et al. 1999; Delva and Kameoka 1999). Furthermore, higher alcohol consumption was found among households with poor, black men (Jones-Webb et al. 1997) and with unemployed individuals (Singer et al. 1992). Acute and chronic alcohol-related mortality was also found more among low socio-economic status groups (Pia 1999). Almost all the literature reviewed above has focused on separate aspects of alcohol consumption. Therefore, there is a need to fill this literature gap.

The main aim of this study is to measure the effects of alcohol consumption on poverty in a systematic way. Sri Lanka is used as a case study as it can be considered as a developing country with relatively high per capita alcohol consumption and a relatively high percentage (34.5%) of the total population either living below the poverty line or just above the poverty line. The contribution of this article differs from previous studies in a number of ways. This is the first study to quantitatively measure the association between alcohol consumption and the poverty level of a household. In addition, this study extends the probit analysis of poverty to include the various illegal alcoholic beverages available in Sri Lanka. Furthermore, both the marginal effects of the various household characteristics and the consumption of legal and illegal alcoholic beverages associated with the level of poverty presented in this study would be valuable inputs for policy analysis, especially, on policy issues associated with illegal alcohol production and consumption.

The rest of the article is structured as follows. The next section presents the methodology used in this study. Section III provides some stylized facts on poverty and alcohol consumption in Sri Lanka along with an overview on the data used in the

study. Section IV presents the estimation results and a detailed analysis of the results. The final section presents the concluding remarks and policy implications.

II. Methodology

As this study proposes to estimate the likelihood of being the category of poor or nonpoor, based on the type of alcohol consumed and other socio-economic factors, the appropriate model to use would be the probit model, with the binary dependent variable taking value 1 if the household is nonpoor and 0 otherwise. The probit model is a linear probability model which has parameters reflecting the changes in the likelihood of being a nonpoor household to changes in the explanatory variables. The model takes the form (Studenmund 2006):

$$y_i = x_i\beta + \varepsilon_i \quad (1)$$

where y_i is the binary dependent variable; x_i is a vector of explanatory variables, β is a vector of the unknown parameters and ε_i is a random-error term assumed to be normally distributed with zero mean. We estimate β such that $Pr[y_i = 1 | x_i] = \Phi[x_i'\beta]$, where Φ is the cumulative distribution function, by applying the maximum likelihood technique.

Using a binary variable to represent poor (or nonpoor) does not measure the impact of the consumption of the types of alcohol and other socio-economic variables on the likelihood of being associated with various levels of household poverty. In order to overcome this limitation, this study disaggregates the poverty level from two levels, poor and nonpoor, to four levels, defined as extremely poor, poor, vulnerable nonpoor and nonpoor, and extends the analysis using an ordered probit model, instead of the binary probit model.

The ordered probit model is a generalization of the standard probit model to the case of more than two outcomes of an ordinal dependent variable (Aitchison and Silvey 1957). Here, the dependent variable y_i^* is now a discrete variable taking the values $\{1, 2, \dots, k\}$. Let P be the official poverty line (OPL) and M be the per capita monthly household income represented by the per capita total monthly household consumption expenditure in rupees. This study uses the OPL to categorize the respondent

households into the following four ($k = 4$) groups based on their income level:

Group 1 ($y = 1$): extremely poor = households with income less than or equal to half the poverty line income ($M \leq 0.5P$).

Group 2 ($y = 2$): poor households = households with income between half the poverty line income and poverty line income ($0.5P < M \leq P$).

Group 3 ($y = 3$): vulnerable nonpoor households = households with income between the poverty line income and 1.5 times the poverty line income ($P < M \leq 1.5P$).

Group 4 ($y = 4$): nonpoor households = households with income greater than 1.5 times the poverty line income ($M > 1.5P$).

The general specification of the ordered probit can be written as:

$$y_i^* = x_i' \beta + \varepsilon_i \quad (2)$$

where y_i^* is a latent variable measuring the severity of i th household poverty and all other variables are as defined in Equation 1. The marginal effects of the variables obtained from the estimates of the ordered probit model measure the impact on the likelihood of being in a poverty level as a result of changes in the various explanatory variables.

In our empirical specification, the decision on which variables to include is ultimately based on exploratory analysis. Based on past studies, possible explanatory variables expected to have an effect on household poverty in the context of Sri Lanka, shown in Table 1, include socio-demographic, socio-economic, location and alcohol consumption status variables. The forward step-wise regression technique is used to select the significant variables. The goodness-of-fit of the models is evaluated using an overall goodness-of-fit statistic developed by Ben-Akiva and Lerman (1985) and the model with the highest goodness-of-fit value will be selected for our analysis.

III. The data

The main data source of this study is the Household Income and Expenditure Survey (HIES) conducted by the Department of Census and Statistics (DCS) of Sri Lanka. In this section, some stylized facts on

Table 1. Model explanatory variables.

Variables*	Description
<i>Socio-demographic characteristics</i>	
<i>PChildren</i>	Proportion of children (0–14 years) in the household
<i>Average age</i>	Average age of the household members (years)
<i>Household size</i>	Number of members in the household
<i>Unemployed rate</i>	The number of unemployed adults (15–64 years) expressed as a the percentage of the total number of adults in the household
<i>Education_HH</i>	Household head's education level (years)
<i>Male_HH</i>	1 if male headed household and 0 otherwise
<i>Marital_status_HH</i>	1 if household head married and 0 otherwise
<i>Geographical location</i>	
<i>Urban</i>	1 if urban sector and 0 otherwise
<i>Rural</i>	1 if rural sector and 0 otherwise
<i>Estate</i>	Base location
<i>Type of alcoholic beverage</i>	
<i>Kasippu</i>	1 if household member(s) consumed kasippu; 0 otherwise
<i>Toddy</i>	1 if household member(s) consumed toddy; 0 otherwise
<i>Arrack</i>	1 if household member(s) consumed arrack; 0 otherwise
<i>Beer and Stout</i>	1 if household member(s) consumed beer and/or stout; 0 otherwise
<i>Other liquor</i>	Base alcoholic beverage type

Note: * HH – household head

poverty and alcohol consumption in Sri Lanka are presented before introducing the main database used in this study.

Poverty in Sri Lanka

Poverty in Sri Lanka has been measured in various ways. Figure 1 illustrates recent trends in household poverty in the three sectors, urban, rural and estate, in Sri Lanka. As can be seen, incidence of poverty at the national level has declined steadily from 26.1% in 1990/01 to 8.9% in 2009/10. That is, overall, poverty has decreased by 66% during that period. However, the gap in the incidence of poverty between sectors has widened from 1990/91 to 2006/07 although the gap has narrowed in 2009/10. Urban and rural poverty has declined by 59% and 47% between 1990/91 and 2006/07, respectively, while incidence of poverty has increased in the estate sector by around 56% during the same period. However, poverty in the estate sector has also significantly decreased from 32.0% in 2006/07 to 11.4% in 2009/10.

Although poverty has decreased significantly in recent years, as shown in Fig. 1, recent studies have shown that many people who have managed to get out of poverty or people who are just above the poverty line are still at risk of slipping back to the below poverty line (Nanayakkara 2012).

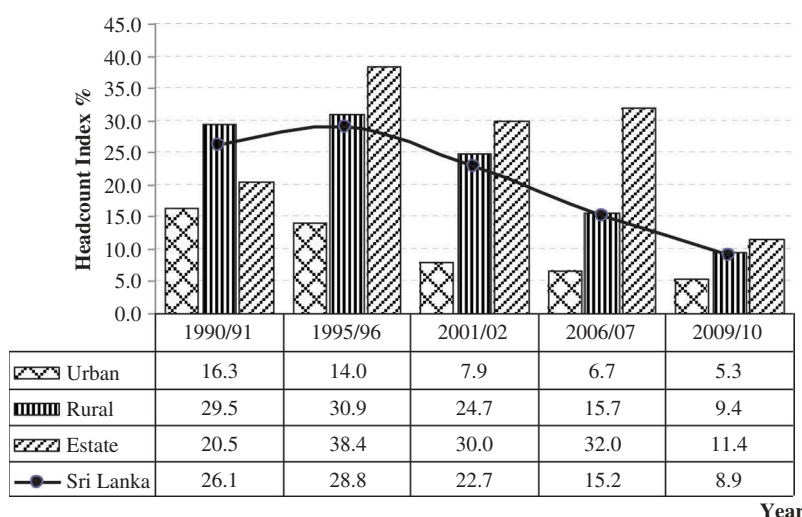


Figure 1. Headcount index by sector, Sri Lanka.

Source: Based on data from *Department of Census and Statistics (DCS)*, various years.

Alcohol consumption in Sri Lanka

Alcoholic beverages have become much more readily available over the past two decades in most developed and developing countries, including Sri Lanka. According to WHO (2011), the average annual per capita consumptions of alcohol in Sri Lanka and South East Asia are 0.8 litres (of pure alcohol) and 2.2 litres (of pure alcohol), respectively, for the period 2003–2005. Since the privatization of Sri Lanka's alcohol industry in March 1992, liquor production in the country has increased rapidly.

Apart from the legal alcohol market, there is a large illegal alcohol market in Sri Lanka. *Kasippu*¹ and *toddy* are the two main illegal alcoholic beverages available in the illegal market. These are basically home-brewed alcohol produced at low cost. Illegal brewing is a lucrative business in most parts of the country and these alcoholic beverages are also readily available in rural areas. The type of alcohol classification in the HIES 2006/07 identifies eight major categories: arrack, kasippu, toddy, beer/stout, gin, whisky/brandy, wine and others, with gin, whisky/brandy and wine included in 'Other liquor' due to limitations in the reported data. Arrack, beer/stout, gin, whisky/brandy and wine are considered as legal alcohol and they are sold in the legal alcohol market.

In rural areas of Sri Lanka, people who drink alcohol mainly consume locally produced alcohol.

Poor households also tend to spend a larger proportion of their income on alcohol (Jayathilaka 2007). This can also be evidenced from Figs 2 and 3 based on the 2006/07 HIES data. As can be seen from Fig. 2, low-income households spend a higher proportion of their income on alcohol compared to high-income households. Furthermore, from Fig. 3, one can see that low-income households also spend a larger share of their income on illegal alcohol, compared to high-income households, which spend a larger share of their income on legal alcohol.

The health profession also points out that the third biggest health issue globally is related directly to alcohol consumption. Alcohol consumption is estimated to cause from 20% to 50% of cirrhosis of the liver, epilepsy, poisonings, road traffic accidents, violence and several types of cancer. These consequences of alcohol consumption are particularly severe among the poor (WHO 2011). Moreover, the DCS in 2005 reported a cirrhosis mortality rate of 33.4 per 100,000 males in Sri Lanka, which is among the highest in the world, compared to 14.1 in the United Kingdom and 28.14 in France (Leon and McCambridge 2006; Abeyasinghe 2011). As Dayaratne (2011) noted, with the increasing living standards of the population, alcohol consumption has increased despite the fact that a policy framework to combat alcohol consumption is in place in the country.

¹This is the most common and accepted name of illicit brewing in Sri Lanka.

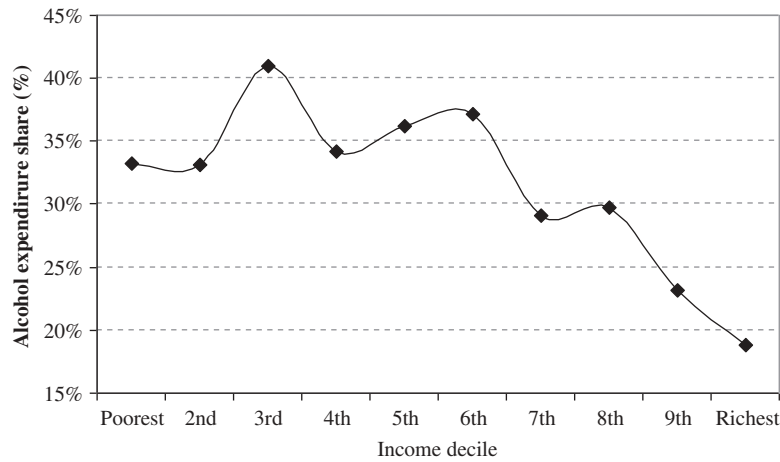


Figure 2. Expenditure share of alcohol by income deciles, 2006/07.

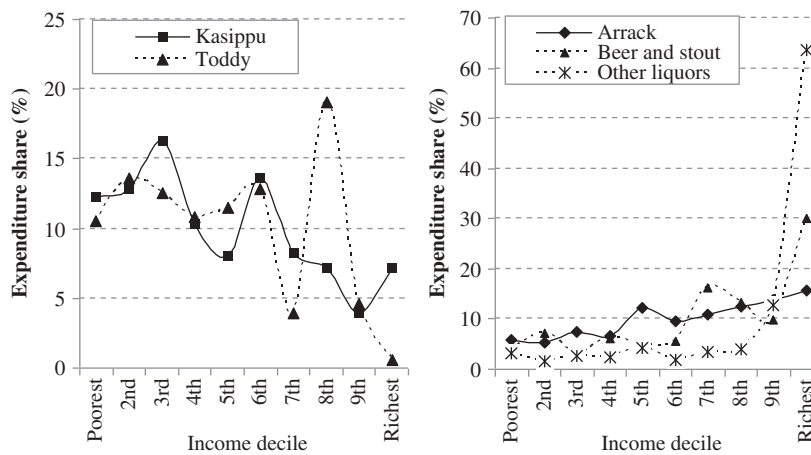


Figure 3. Expenditure share of alcohol types by income deciles, 2006/07.

The data

The data used for this study are from the micro level national HIES in year 2006/07 for Sri Lanka.² This study uses the Cost of Basic Needs (CBN) approach³ to compute the poverty line. In Sri Lanka, a household is considered to be poor if the persons living in the household had a real per capita total consumption expenditure below $P = 2,233$ (SL) rupees in year 2006/07. This poverty line is used to classify households into four different poverty groups. The various levels of poverty and the percentage of the population falling within

Table 2. Levels of poverty among Sri Lankan households, 2006/07.

Level of poverty	Monthly expenditure (SLRs)	Percentage			
		Overall	Urban	Rural	Estate
(1)	(2)	(3)	(4)	(5)	(6)
Extreme poor	<Rs1116	0.4	0.1	0.4	0.9
Poor	Rs1117–Rs2233*	12.6	4.7	13.6	26.6
Vulnerable nonpoor	Rs2234–Rs3350	21.6	14.5	22.5	35.7
Nonpoor	>Rs 3350	65.4	80.7	63.4	36.8

Note: * Official poverty line.
Source: Based on DCS (2007) HIES datasets.

each level for 2006/07 are presented in Table 2. As can be seen from column (3), overall, about 13% (=0.4 + 12.6) of the households are poor and 87% (=21.6 + 65.4) are nonpoor. Even though, overall,

²HIES is conducted every 5 years by the DCS. HIES of 2006/07 was the sixth series and was conducted during the period from July 2006 to June 2007. This survey covered 18,544 households (76,749 persons) in all provinces in the country excluding Northern and Eastern Provinces, due to the unavailability of a proper sampling frame and civil war in those areas. Even though the HIES 2009/10 data are also available now, as this survey was done very close to the end of the 30-year war in Sri Lanka, the data are not reliable.

³The Sri Lankan government had been using a poverty line based on a Food-Energy-Intake (FEI) method but now uses the CBN method to derive the OPL in Sri Lanka. The FET method of the poverty line is based on the minimum expenditure needed to consume the minimum number of calories needed for survival. The CBN poverty line includes not only the minimum food expenditure but also nonfood expenditure for subsistence.

87% of the households are nonpoor, about 21.6% of the nonpoor are vulnerable nonpoor.

As can be seen from columns (4) and (5), the highest proportion of nonpoor (80.7%) live in the urban sector and the highest percentage of poor (26.6%) and vulnerable nonpoor (35.7%) live in the estate sector. This indicates that about 62% of the households in the estate sector are either poor or vulnerable nonpoor, while more than 80% of the urban households and more than 63% of the rural households are nonpoor. This shows the severity of poverty in the estate sector, compared to the other sectors. Therefore, the sector (where a particular household is located) should also be considered as an important factor in determining the level of poverty.

IV. Estimation results

The relationship between poverty and type of alcohol consumed

For estimation, we first use the probit model as described in Section II. The data used for the estimation include 2326 poor households and 15,590 nonpoor households in Sri Lanka. The estimation results are presented in Table 3.⁴ The area under the receiver operating characteristic curve (not presented here) is found to be 0.7458, and it can thus be inferred that the estimated probit model fits very efficiently to explain the link between the consumption of different types of alcoholic beverages and poverty. As can be seen from Table 3, the coefficient estimates of the socio-demographic variables show that the proportion of children in the household, the average age of the household, the household size, the rate of unemployed in the household and the male headed household all have a negative effect on being nonpoor. The marginal effects highlight that, for every 1% increase in the proportion of children in a household, the probability of being in a poor household would increase by about 0.20 percentage points. The estimated coefficients of the average age of the household members and household size reveal that a one-year increase in the average age will

Table 3. Probit model estimation results, Sri Lanka

Variable	Estimate	Robust SE	Marginal effect (in percentages)
Constant	1.5747***	0.1012	
<i>Socio-demographic characteristics</i>			
<i>PChildren</i>	-0.0014***	0.0009	-0.20
<i>Average age</i>	-0.0078***	0.0018	-0.14
<i>Household size</i>	-0.1719***	0.0078	-3.02
<i>Unemployed rate</i>	-0.0028***	0.0006	-0.05
<i>Education_HH</i>	0.0199***	0.0034	0.35
<i>Male_HH</i>	-0.0736**	0.0316	-1.32
<i>Marital_status_HH</i>	0.1814***	0.0326	3.41
<i>Location</i>			
<i>Urban</i>	1.2067***	0.0491	14.96
<i>Rural</i>	0.4885***	0.0374	9.46
<i>Type of alcohol</i>			
<i>Arrack</i>	0.5207***	0.0523	6.90
<i>Beer and Stout</i>	0.9392***	0.2686	8.78
Log likelihood		-6076.8	
Number of observations		17,916	

Note: *** significant at the 1% level, ** significant at the 5% level.

increase the probability of being poor by 0.14 percentage points and the addition of a member to the household increases the probability of being poor by 3.02 percentage points. It is important to note that the household head's education is an important factor in reducing the incidence of poverty. The results show that for every additional year of household head's education, the probability of being poor will decrease by 0.35 percentage points.

Marginal effects of the geographical location of the households show that the likelihood of being poor will be 14.96 and 9.46 percentage points lower, respectively, if the household is located in the urban or rural sector, compared to being located in the estate sector. That is, a household in the estate sector has a much higher chance of being poor compared to those living in the rural sector and households in the rural sector have a much higher chance of being poor compared to those in the urban sector.

The coefficients of the types of alcoholic beverages reveal that the drinking of arrack and beer and stout beverages is significantly associated with nonpoor households. [The illegal beverage coefficients are not significant and are not included.] Considering the marginal effects shows that being a household consuming arrack or beer and stout increases the probability of being a nonpoor household by 6.9 and 8.78 percentage points, respectively.

⁴The possible problem of endogeneity in model (1) was investigated for the Sri Lankan data and was found it not be a problem. We also performed an IV estimation using budget shares of alcohol types as an instrumental variable (satisfying the required conditions), and found that the estimation results are very similar to the estimation results presented in Table 3.

The relationship between the poverty level and the type of alcohol consumed

The probit model was extended further into an ordered probit model to consider the effects on the intensity of poverty. For the variable selection in each specification, a forward stepwise technique⁵ was adopted. Thirteen different model diagnostic criteria were considered in assessing the reliability of results. The forward stepwise methodology suggested that adding variables did not change the significance of the existing variables. In addition, the variance inflation factor (VIF) was calculated and found to be low, confirming that multicollinearity is not a problem. Table 4 presents the estimation results of the final ordered probit model. Marginal effects, separately calculated for extreme poor, poor, vulnerable nonpoor and nonpoor groups, provide an interpretation of the substantive effects of the independent variables. A goodness-of-fit statistic, the adjusted log likelihood index ratio and the number of observations are also given in the table.

The marginal effects of the socio-demographic variables reveal that a 1% increase in the proportion of children in the household leads to an increase in the probability of being poor by 0.14 and 0.16

percentage points for poor and vulnerable nonpoor, respectively. For every additional member in the household, the likelihood of being in a poor household would increase by 3.07 percentage points. Considering the characteristics of the household head, the education level is an important factor in determining the level of poverty. One additional year of household head's education will decrease the probability of reporting as vulnerable nonpoor by 0.67 percentage points and as poor by 0.60 percentage points. The estimated marginal effect on being poor is 3.5 percentage points higher for households with an unmarried household head compared to those with a married household head. Although the effects of other characteristics of the household head are very small in magnitude, they are all statistically significant.

In order to control for the potential effect on different levels of poverty, a location factor was also included in the model, the coefficient of which implies that vulnerable nonpoor are 21 percentage points and 10 percentage points less likely to be from the urban and rural sector. For the poor, this is 14 and 11 percentage points for urban and rural sectors, respectively. In addition, urban sector households are 36 percentage points more likely to report

Table 4. Ordered probit regression results, Sri Lanka.

Variable	Estimate	Robust SE	Marginal effects (in percentages)			
			Extreme poor (y = 1)	Poor (y = 2)	Vulnerable nonpoor (y = 2)	Nonpoor (y = 4)
<i>Socio-demographic characteristics</i>						
<i>PChildren</i>	-0.0085***	0.0007	0.003***	0.14***	0.16***	-0.30***
<i>Average age</i>	-0.0023 *	0.0013	0.01 *	0.04 *	0.04 *	-0.08 *
<i>Household size</i>	-0.1816***	0.0062	0.07***	3.07***	3.41***	-6.55***
<i>Unemployed rate</i>	-0.0026***	0.0004	0.01***	0.04***	0.05***	-0.09***
<i>Education_HH</i>	0.0357***	0.0026	-0.01***	-0.60***	-0.67***	1.29***
<i>Male_HH</i>	-0.0485 **	0.0235	0.02 *	0.83 **	0.91 **	-1.76 **
<i>Married_HH</i>	0.1929***	0.0247	-0.09***	-3.50***	-3.52***	7.12***
<i>Location</i>						
<i>Urban</i>	1.2418***	0.0344	-0.32***	-14.71***	-21.10***	36.13***
<i>Rural</i>	0.5929***	0.0287	-0.35***	-11.23***	-10.33***	21.90***
<i>Type of alcohol</i>						
<i>Kasippu</i>	-0.1136 **	0.0541	0.05 *	2.05 **	2.08 **	-4.19 **
<i>Toddy</i>	-0.1568 **	0.0754	0.08 *	2.91 *	2.84 **	-5.83 **
<i>Arrack</i>	0.4228***	0.0338	-0.10***	-5.71***	-8.02***	13.83***
<i>Beer</i>	0.6540***	0.1190	-0.11***	-7.17***	-11.94***	19.22***
<i>Ancillary parameters</i>			<i>Marginal effects after ordered probit</i>			
\hat{y}_1	-2.9054	0.0848	0.0012	0.0968	0.2282	0.6738
\hat{y}_2	-1.1616	0.0745				
\hat{y}_3	-0.3191	0.0748				
Pseudo R ²	0.1005					
Log likelihood	-14,391					
Number of observations	17,916					

Note: *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level.

⁵New variables for selection with *p-value* <0.10 and previously selected variables for removal with *p-value* ≥0.15. Number of elderly, headship, age of the household head and other liquor variables were not selected by the stepwise technique.

being nonpoor. Furthermore, rural sector households are 21 percentage points more likely to report nonpoor. This shows that if the household is located in the urban sector, it would have a higher chance of being reported as being nonpoor. This is due to the better opportunities for accessing productivity (e.g., technology, irrigation, infrastructure, marketing opportunities and employment) resources in the urban areas.

The differences in the probability values for the various types of alcoholic beverages show a very interesting result. Although arrack, beer and other legal beverages are mainly consumed by the nonpoor, the consumption of kasippu or toddy increases the likelihood of being in a poor household.

Considering the marginal effects of all variables for poor and vulnerable nonpoor, it can be seen that the magnitude and sign of the effects are very similar. This shows that even though the vulnerable nonpoor households are considered as 'nonpoor', in contrast to the nonpoor households, they behave as if they are poor. The sign of the marginal effects of each variable is the same for extreme poor, poor and vulnerable nonpoor households and the opposite for the nonpoor households.

Marginal values of the ordered probit model were plotted on a heat map chart in terms of the different alcoholic beverages and the level of poverty (Fig. 4). To provide a better picture, the density of the colours in the map was modified to change according to the positive marginal values. This map clearly shows the link between the different income groups and the consumption of different alcoholic

beverages. Looking at the signs of the marginal effects in the map, overall, it is clear that nonpoor households are negatively associated with the consumption of kasippu and toddy while the vulnerable nonpoor, poor and extremely poor households are positively associated with the consumption of these beverages. On the other hand, nonpoor households are positively associated with arrack and beer consumption while other households are negatively associated with the consumption of these beverages. These observations also confirm the fact that, despite being classified as nonpoor by definition, the vulnerable nonpoor households' behaviour in terms of alcohol consumption is similar to that of the poor households.

It can also be seen that those who consume the legal alcoholic beverages (arrack and beer) are 13–19 percentage points more likely to be nonpoor. Consumption of kasippu or toddy increases the probability of being poor. Kasippu consuming households are 2 percentage points more likely to report as poor than the vulnerable nonpoor households. Furthermore, toddy consuming households are 3 percentage points more likely to report as poor than the vulnerable nonpoor households.

V. Conclusion

The main objective of this study was to identify the level of association between alcohol consumption and poverty. Although econometric models have been used to study many aspects of poverty and

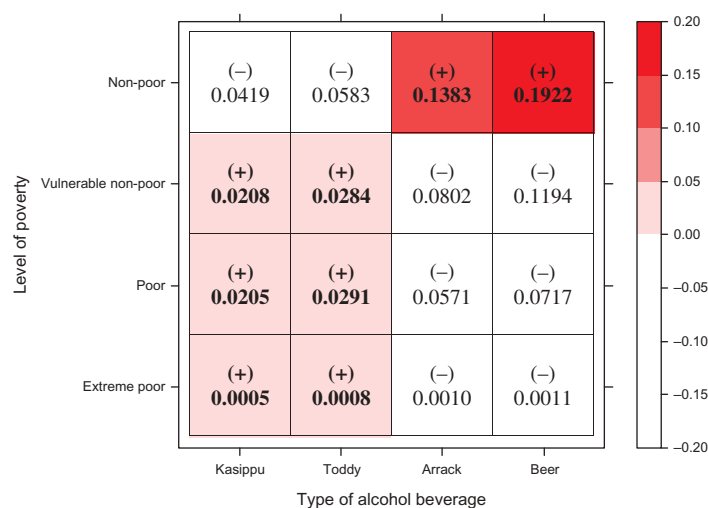


Figure 4. Heat map for marginal effects.

alcohol, a limited number of attempts have been made to study the link between alcohol consumption and poverty econometrically. Therefore, this study provides a socio-economic benchmark to enhance the examination of the alcohol poverty nexus. Numerical findings of this study have demonstrated that alcohol consumption, particularly, illegal alcohol consumption, significantly affects the poor who are close to the poverty line. The study has also demonstrated that poor households and vulnerable nonpoor households spend a very high proportion of their income on alcohol and there is a strong relationship between being poor and the consumption of illegal alcoholic beverages. Without doubt, illegal alcohol consumption is especially prevalent in the poor and vulnerable nonpoor households, particularly, those within the rural and estate sector. Households who consume these beverages have 2–3 percentage points greater likelihood of being in a poor household than the nonpoor household in Sri Lanka. The study also analytically measured the association between the consumption of various types of alcoholic beverages and the level of poverty among households. The results find that even though the vulnerable nonpoor are classified as nonpoor by definition, their alcohol consumption behaviour is similar to that of the poor households.

There are also some lessons to be learned from this Sri Lankan case study in the context of efforts to eliminate poverty in other developing countries. The results of our study confirm the general view that alcohol consumption has a significant impact on the level of poverty among households in developing countries like Sri Lanka. Furthermore, our results demonstrate that poverty in developing countries cannot be eradicated by simply increasing the income levels of households. Some complementary socio-economic measures are needed to be put in place to improve the quality of households living below the poverty line and just above the poverty line. The findings of this study are also relevant for policy making in terms of poverty alleviation in developing countries, beyond MDGs. Particularly, the policy focus beyond MDGs should not only be on increasing households' income levels but should also be on other socio-economic characteristics such as their legal and illegal alcohol consumption patterns.

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