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Demand for Alcohol among the Poor in Ibadan Metropolis, Nigeria, West Africa

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Abstract
The lack of access to opportunities continues to marginalize low-income populations, limiting their active participation in socio-economic processes. Their lack of empowerment limits their choices in almost everything, and their alcohol consumption makes them vulnerable to disease and violence. These bring a negative impact on public finance. In this research, the study examines the determinants of demand for alcohol among poor people in Ibadan metropolis. The theoretical framework of the study is hinge on Neo-Classical Theory of Demand and Addiction. The paper utilizes 2 stage hurdle model. The major findings show that income is not a determinant of demand for alcohol among the poor. Moreover, the demand for alcohol exhibits characteristics similar to that of luxury goods, whereby an increase in price is accompanied by a corresponding rise in demand. It is therefore recommended that moral adjustment campaign in terms of abstinence involving all social actors such as: individuals, businesses, associations, voluntary organizations and the governments should be encouraged.
Keywords: Alcohol, Demand, Poverty, Addiction and Ibadan Metropolis

1. Introduction

Alcohol is an extraction made from ethanol and it can be highly intoxicating when it has undergone fermentation process. It comprises of wine, spirit, beer and other traditional drinks (Roche & Bujarski *et al.* 2019). Alcohol, is a substance (Leppanen & Sullstrom, 2001; Bélanger & Akre, 2011; Adegoke & Olasupo, 2014). This is due to the fact that it comprises substances consumed to induce a state of stupor or diminished sensory awareness. Statistics from Global Status Report on Alcohol and Health (GSRAH), (2018) showed that the worldwide consumption of alcohol in 2016 was equal to 6.4 litres of pure alcohol consumed per person aged 15 years or older. A larger portion of the consumption was 28.6 percent or 1.76 litres per person. Some 2.348 billion people (43% of the global population) are current drinkers. The proportion of adults drinking rose from 46% to 77% among men and 2% to 11% among women between 2002 and 2016 (Pham, Tran & Tran, 2018). The world alcohol consumption per capita is presented in table 1. The proportion of alcohol consumed was rated highest in low-income countries such as Gambia, Mali, Nigeria and Ghana with 31%, 29%, 23% and 20% respectively compared to 13 % total consumption of alcohol from United State of America. Average daily consumption for Gambia was estimated at 64% and Nigeria had 50% compared to United State that was 29%. By 2025, the projection for total alcohol consumption by WHO in Gambia and Nigeria would be 2.8% and 11.3% respectively while United State would be 9 percent (WHO, 2020).

However, studies such as (Farrelly & Bray, 2001; Ozoh & Exeil, 2016; Clements & Mariano et al. 2022) have argued that the addictive nature of alcohol and other substance has made their price elasticity to be inelastic. One of the pressing questions in the mind of the readers is “Do the poor use alcohol, frequently than other economic groups?” While many people would answer “yes” to the question, some growing body of knowledge indicate that a lack of income alone does not increase the chance that a poor individual will use the substances more (Roche *et al,* 2019). Studies have shown that the relationship between poverty and substance use is more complicated. Beyond lack of income, as a result of poor life condition, poverty increase the risk factor of unemployment and likely to become addictive to substance or alcohol use (Madras *et al*, 2019). In the World Drug Report, (2018), poor communities face significantly higher rate of addiction while addiction increase the risk of poverty. This means that poor individuals are three times more likely to have addiction to substances use than the higher or average income individual.

Table 1: Proportion (%) of recorded alcohol per capita (15+ years) consumption consumed in the form of beer, wine, spirits and other types of beverage.

Country	Distribution of Recorded Consumption of Alcohol				Total Consumption	Average daily consptn.	Projection of Total consumption		
	% Beer	% Wine	% Spirit	% others			2015	2020	2025
High Income Countries									
Japan	19.2	4.1	52	24.7	10.4	22.4	7.5	7.9	8.3
US	50	17.3	32.7	0	13.3	28.7	9	9	9
UK	36.9	53.8	21.8	7.5	13.8	29.8	12	12.2	12.5
Canada	51.2	22	26.8	0	13.2	28.9	10.3	10.5	10.7
Germany	53.6	27.8	18.6	0	14.7	31.7	10.6	9.8	9
Low Income Countries									
Burkina Faso	10	3	3.1	83.8	18	39.2	7.4	7.6	7.8
Congo	78.4	9.4	10.9	0.8	13.6	29.3	3.9	3.7	3.6
Gambia	5.6	0.7	0.3	93.5	30.9	64.1	3.2	3	2.8
Guinea	78.4	16.3	3.7	1.1	8.4	17.9	0.7	0.7	0.8
Mali	13.3	1.5	2.1	83.1	29.3	59.4	1	1	1
Senegal	55.1	41.3	3.6	0	10.2	21.7	0.5	0.5	0.5
Serial León	6.4	0.5	0.7	92.3	19.5	42.4	8.2	7.9	7.9
Zimbabwe	23.7	1.7	6.8	67.7	14.6	31.4	4.8	4.6	4.4
Lower-Middle Countries									
Nigeria	8	0.4	0.9	90.7	23.1	50.1	11.3	10.4	11.3
Ghana	30	9.7	2.9	57.3	20.6	43.9	5.4	5.7	5.9
Kenya	56.1	1.8	21.6	20.4	18.9	41.2	4	3.8	3.6
Upper-Middle Countries									

China	27.8	3	69.2	0	15.1	32.7	7.6	7.9	8.3
Algeria	62.6	35.5	0	2	10.9	23.5	0.6	0.6	0.6
South Africa	48.1	17.8	16.7	17.4	27.1	58.5	11.5	11.9	12.1
Ecuador	67.3	1.2	31.5	0	15.2	32.6	6.1	5.7	5.6

Source: Global Status Report on Alcohol and Health (GSRAH), (2018)

Alcohol is one of the most commonly used substances and abused by the poor (Tucciarone, 2021; WHO, 2022). Studies have shown that the marginalization of poor individual has steadily increased the prevalence use of those substance (Madras & Han et al, 2019). The persistent use of alcohol yields adverse consequences. First, heavy-drinking people who are poor experience more frequent and severe negative health consequences (Suzanne & Brenda et al. 2010). However, (Suzanne et al., 2010; Moagi & Van der Wath, 2021) stated that high-risk behavioural pattern is associated with risk amplification theory that substances users begin a negative developmental trajectory that results into violence and crime. This issue has increased civil unrest and insecurities in the society (Suzanne et al 2010).

Furthermore, the relationship between price and quantity demand for alcohol among poor people has become the subject of economic debate (Payne et al. 2020). This is because relevant policies debates continue to receive attention based on appropriate measures on substance control. Study such as Tian & Liu, (2011) have argued that alcohol follow addiction and the positive relationship of price and quantity demand for alcohol and its nature (ostentatious goods) has made taxes rate not to be appropriate tool for a policy option. While studies have independently examined the prevalence of alcohol use, the determinants of demand for alcohol among the poor have not received much attention. Few studies (Galváo, et al., 2018; Roche *et al,* 2019; Madras *et al*, 2019; Tucciarone, 2021) that have worked in this area concluded that income and price could be a factor influencing demand for alcohol but few studies is yet to establish the submission or refute it among the poor. Therefore, this study examines the determinants of demand for alcohol among poor people in Ibadan metropolis.

2. Literature Review

In the theory, two arguments dominate this topic and they are Neo-Classical theory of Demand and theory of Addiction. Traditional demand theory is based on the Neo-classical model of consumer choice. Neo-classical consumer (demand) theory assumes to have properties of non-negative, divisible and unbounded. The theory is founded on building blocks constituting concepts of utility function, commodity set, and the axioms governing the ordering of consumer 's preference. The consumption basket contains a mix of all goods the consumers purchase at given commodity prices and consumer 's purchasing power. Hence, the theory begins its analysis by considering individuals as consumers only and with the question of choice that consumers make during their budget allocation activities (Suharno, 2010).

In deriving the utility function under the assumption of order preserving, monotonic, quasi concave, real valued and continuous, a rational consumer chooses the consumption basket, which generates the highest level of utility. Therefore, a set of demand equations can be derived. On this note, parameters are estimated to predict the demand behaviour of the consumer (Suharno, 2010). To obtain the Marshallian demand function consumers maximise their utility (U) as a function of what it can consume (X_i) and it is subject to a budget constraint. On the other hand, Becker & Murphy (1988) state that habits that pervade everyday life can be properly described as addictive. While the degree of addictiveness varies from activity to activity and person to person, habits such as drinking or eating, and a host of others often meet the two conditions required for addiction: reinforcement, in that, the more you partake of the activity, the more you want to partake; and tolerance, in that the more that you partake of the activity, the lower your future utility, given the amount of future consumption. This theory comprises of imperfectly rational addictive, rational addiction and myopic addiction theory.

Various methods have been used by studies in measuring, modelling and estimating determinants of demand for alcohol. The models of drinking alcohol are based on the economic theory of demand which assumes that there is provision of an individual's utility function (Nelson, 2013). For instant, Moshoeshoe, (2012) has used hurdle model to measure dependence between the participation and consumption decision. The model is to address both the selectivity bias and the omission of variables bias which may result as a consequence of a non-random sampling nature of the data. It therefore proposes a two-step procedure. In the same vein, Belotti & Deb, (2015), captured a decision process with two-part model that is characterised by activity of individuals who have form habit on consumption. In this method, the first part is that an individual made a

decision to seek medical care and the second part, the health care provider made a decision on how many times the individual should return to complete the treatment. In this model, the SUR model is usually estimated using the Generalized Least Squares (GLS) method. This is a two-step method where in the first step we run ordinary least squares regression for the model (Stanley & Doucouliagos, 2012).

Empirical stand on this issue varies in results because of different data proxies, methodology and area of coverage. Suthar (2017) examines the current pattern of consumption of alcohol, determinants of its demand and supply as well as its policy implications in order to assist the decisions of government from demand and supply perspective. This study found that price of alcohol is a key determinant. Similarly, Guindon et al (2022) measures the impact of taxes and prices on alcohol use with particular attention to the different context of rising alcohol consumption in low- and middle-income countries. The result of the study shows higher taxes and prices were associated with lower heavy episodic drinking and heavy drinking. Consequently, the gap in the literature left out examination into the determinants of demand for alcohol among poor people in Nigeria.

3. Methodology

The theoretical framework of this study followed two theories which are Rational Addiction theory (Becker and Murphy, 1998; Grossman & Charloupka, 1998) and Almost Ideal Demand System (AIDS) theory developed by Deaton and Muellbauer, (1980) and modified work of Janda et al, (2010), Hassan, (2010), Suharno, (2010), Moshoeshoe, (2012), Adetunji & Rauf , (2012), Milian et al. (2019), Al-Mahish, Abd El-Radi & Mursi (2021). While rational addiction theory captures the addictive nature and decision making of the poor, this study uses almost ideal demand system to determine the demand for alcohol among the poor. The theory states that consumer is rational if he/she would recognise the future consequences of current drinking decisions and take into account in planning a sequence of consumption level.

The study adopts Grossman & Charloupka, (1998) model which assume that consumers maximize a lifetime utility function given by:

$V = \sum_{t-1}^{\infty} \beta^{t-1} U(Y_t, C_t, C_{t-1}, e_t)$ 1

Here Y_t is consumption of a non-addictive good at time or period t, C_t is consumption of an addictive good (alcohol) at period t, C_{t-1} is alcohol consumption at period t-1, e_t reflects the effects of unmeasured lifecycle variables on utility and β is the time discount factor ($\beta = 1/(1+r)$) where r is the rate of time preference for the present. An increase in lagged alcohol consumption (C_{t-1}) lowers utility if the addiction is harmful ($\partial U/\partial Ct\text{-}1 < 0$), while an increase in the lagged consumption raises utility if the addiction is beneficial ($\partial U/\partial Ct\text{-}1 > 0$).

Their model states that;

DRINK = $\alpha + \beta * PRICEsm + \gamma * INCOMEsm + \delta * Mm + \emptyset * Ss + \epsilon$ ……. 2

where DRINK is the measure of drinking in state*s* in month *m*; *PRICE* is the price of the substance in that state and month; *INCOME* is the personal income of the poor in that state and month; and *M* and *S* are full sets of month (it include dummies for each calendar month in the sample period) and state dummies, respectively.

The Model

This paper utilizes 2 stage hurdle model. Hurdle model established the intertemporal choice of developing an addiction. The first stage decision is the decision to participate and take alcohol as stated above while the second stage takes the decision to quit, the hurdle model contains two equations:

The first hurdle is the participation stage. This is the stage whereby the individual take the decision to take alcohol. At this stage, the consumer of alcohol decide whether to take alcohol. K represent the participation which takes on 1 if participation is reported and takes 0 if otherwise (that is K=1 or K=0). This is examining through probabilities. The probit model for stage 1 is modelled as follows.

$Pr(K = 0|P_A, x, y) = 1 - \Phi(P_A X, Y \gamma)$……………………………….. 3

Equation 3 is the probit estimate showing probability of individual participating in alcohol

Where Φ represents a standard normal distribution function, $\boldsymbol{P}$ is a vector of prices of the goods.

The second stage is the quitting stage. Individual who has passed the first stage will have to make another round of decision. At this stage, the consumer takes the decision to quit taking alcohol. G represents the Quitting which takes on 1 if quitting is reported and 0 if otherwise (G=1 or G=0). The probit model for this stage is given as:

$$Pr(G = 0|\boldsymbol{P}_A, z, y) = 1 - \Phi(\boldsymbol{P}_A Z, Y'\rho) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.. 4$$

Equation 4 is the probit estimate for probability of individual quitting alcohol ρ is the probit estimate of parameters vectors at the decision to quit stage.

The study uses probit method to determine the elasticity of demand for alcohol in Ibadan metropolis, Nigeria. The target population for this study is in Ibadan, Oyo State of Nigeria. In Ibadan, there are eleven Local Government areas: Akinyele, Egbeda, Lagelu, Ona Ara, Oluyole, Ibadan North, Ibadan North-East, Ibadan North-West, Ibadan South-East, Ibadan South-West and Ido LGAs. It includes all young men and women aged 15- 49years and old men and women aged 50years above who considered Ibadan to be their usual place of residence. A multistage sampling design was adopted. The sampling selection was done in 11 local government area of Ibadan. The first stage involved a purposive selection of five local governments from the eleven local governments in Ibadan metropolis. This selection was based on high prevalence of alcohol use in the area (Adegoke et al, 2014). These are: Akinyele, Egbeda, Ibadan North, Ibadan North-East and Ibadan South-East (Mapo area). The second stage of selection involved a purposive selection of motor parks, market places and beer parlours across 5 selected Ibadan Local Government Areas. The 500 questionnaires are divided into four sections and the last three sections are to capture alcohol use.

Table 2: Description of Variables and Measurement

Table 2 below presents the description of data used. The data used were collected in Ibadan and were put into use as stated in the table

Code	**Variable Name**	**Variable Description**
K	Participation	1 if participation is reported and takes 0 if otherwise
$\boldsymbol{P}_A$	Vector price for alcohol	Real retail price of one bottle of alcohol in Naira
X	Vector of demographic variables, taste, fashion, household size, household position, habits, shame and peers influence.	Demographic variables (Age, sex, ethnicity, marital status, apartment and education); Fashion (social gain, drink and smoke at social events,); Household size; Household position (head, child, relative,

		other household and spouse); (consumer forced to drink or smoke, othersib1i.e other siblings taking alcohol)
Y	Total income	
Φ	Normal distribution parameter	
γ	Probit estimate parameter	

4. Results and Discussion

Determinants of Demand for Alcohol among the Poor

The table 3 below describes the characteristics of the poor in Ibadan Metropolis. The mean and standard deviation are presented as well. The percentage of male at the poor communities is (80.1%) while female is (19.5%). The results on marital status show that the percentage of singles is (55.8%), married is (35.8%), divorced or separated is (6.2%) and widow or widower is (2.2%). The result on education of the respondents shows that most of the respondents have gone through formal education with at least primary school certificate (88%) while 11.9% of the respondents do not have formal education. The result on ethnicity shows that Yoruba tribe has the highest scores with 66.4% and Igbo tribe records second highest with (21.2%). The result on religion shows that most of the respondents are Christians with (54.4%) while few of them practice traditional religion (1.8%).

Table 3: Demographic Characteristics

	Variables	**Frequency**	**Percent**
1	**Education**		
	No Education	27	11.9
	Primary School	38	16.8
	Secondary School	78	34.5
	Post-Secondary School	83	36.7
2	**Ethnicity**		
	Yoruba	150	66.4
	Hausa	27	11.9

	Igbo	48	21.2
	Others	1	4
3	**Religion**		
	Christianity	123	54.4
	Muslim	99	43.8
	Traditional	4	1.8
4	**Marital Status**		
	Single	126	55.8
	Married	81	35.8
	Widow/widower	5	2.2
	Divorced/separated	14	6.2

The result in table 4 below present the two hurdle model for alcohol among the poor in Ibadan. In line with the model specification, the decision to consume and quit alcohol is a function of three broad groups of variables: Price factor (Price, Price of other commodities), Income (Proxied by expenditure) and other Demographic variables. In the results, price of alcohol is statistically significant and suggest that own price are ostentatious goods among the poor (31% (0.033)). The results indicate that the price of alcohol is positively and significantly related to the decision to drink alcohol (current participation) which means an increase in price of alcohol will increase the probability of alcohol demand by 31%. It suggests that the demand for alcohol is ostentations while price of alcohol is not a determinant of decision to quit alcohol consumption. Income is negatively related to current decision to consume alcohol. A unit increases in income is less likely to increase consumption of alcohol by 50 percent, while income is less likely to increase decision to quit alcohol.

This result shows that a change in education attainment from primary, secondary to post-secondary education are more likely to increases demand for alcohol of the poor respectively by 1% and 10% than illiterate while these factors are less likely increase decision to quit by (110%, 132% and 147% respectively). Age of the respondent is classified in the study into two. It is current age and old age. The result shows that current age and old age are not significant determinant of current decision to consume alcohol. Gender (female) is associated with demand

for alcohol. The older (Age Square) the age of the respondent the more likely he/she quit alcohol drinking by 3%.

Tables 4: Determinants of Demand for Alcohol

Alcohol Variables			
		Participation	**Quitting**
A	**Own price**		
	Log Price of Alcohol	0.3139 ***(2.14)*** (0.033**)	-0.1197 ***(-1.78)*** (0.075*)
	Other Prices		
	Log Price of Cigarette	0.0665 (0.520)	0.0154 (0.827)
	Log Price of Marijuana	0.1223 (0.263)	0.066 (0.411)
B	**Income (proxied by expenditure)**	-0.5161 (0.035**)	-0.0114 (0.950)
	Expenditure on Alcohol Substance		
C	**Education Attainment**		
	Primary	2.3522 (0.012**)	-1.102 (0.144)
	Secondary	20.261 (0.014**)	-1.324 (0.084*)
	Post-Secondary school	1.553 (0.087*)	-1.4702 (0.078*)
	No education (Reference category)		
	Forced consumption at first time	0.1309 *(0.766)*	-0.2339 (0.605)
D	**Individual Factors**		
	Current Age	0.0565 (0.803)	-0.1726 (0.178)
	Age-Square	0.0002 *(0.953)*	0.0031 (0.056*)
	Gender (Female = 1)	1.4336 (0.078*)	0.4675 (0.323)
	Single (Married = 0)	-1.895 (0.997)	2.2265 (0.270)
E	**Household Factors**		
	Household size	-0.1364 (0.076*)	0.0458 (0.541)
	Head	-4.9005 *(0.995)*	0.223 (0.721)
F	**Residential Type**		
	Flat	0.1143 (0.995)	-0.0948 (0.884)

	Self-contain	0.6194	(0.409)	-0.2881	(0.653)
	No Apartment	0.6802	(0.658)		
	Duplex (Reference category)				
G	**Tribe**				
	Yoruba	-3.9029	(0.999)	0.8213	(0.263)
	Igbo	5.0495	(0.999)	1.4512	(0.104)
	Others (Reference Category)				
	Constant	14.321	(0.997)	-1.6774	(0..670)
	No of Observations	184		164	
	Pseudo R2/R-Square	0,4567		0.3306	
	Pro > chi2/F-Stat	0.0019		0.0033	

P<.0.10*, P<0.05, P<0.01*** represent level of significance at 5% and 1%. t score in parenthesis**

Discussion

The analysis reveals that the demand for alcohol among the poor in Ibadan is significantly influenced by price, with a 31% increase in consumption associated with an increase in alcohol prices. This paradoxical result suggests that alcohol may function as an ostentatious good among the poor, where consumption increases as a form of social signaling, rather than being deterred by cost. Interestingly, no strong evidence of addiction was found, indicating that while alcohol consumption is prevalent, it may not be sustained by physical or psychological dependence, at least not in the conventional sense captured by rational addiction theory.

Income was found to be negatively associated with alcohol consumption, implying that poorer individuals are more likely to consume alcohol than wealthier ones. This supports previous findings by Adeniji (2019) and others, who argue that lower-income earners are more prone to substance use. Similarly, studies such as Taylor and Henderson et al. (2020) in Zambia note higher alcohol consumption among rural, lower-income households, suggesting this is a regional pattern in parts of sub-Saharan Africa. Alcohol consumption among the poor also appears to serve social functions, such as fostering solidarity when consumed communally. In such environments, individuals may lack the power to enforce personal boundaries, further normalizing substance use.

Perhaps counterintuitively, education was positively associated with alcohol demand. Respondents with primary, secondary, and post-secondary education were significantly more likely to consume alcohol than those without formal education, by 235%, 2,030%, and 155% respectively (note: these figures likely reflect odds ratios and may require clarification). Muthoni and Olaly et al. (2018) found similar results, showing that individuals with higher educational attainment—particularly teachers with diplomas—had higher rates of alcohol abuse. This may be attributed to factors such as unmet professional expectations, workplace frustrations, or economic pressures faced by educated individuals who remain economically disadvantaged. Wang and Gordon (2012) noted that increased responsibilities without commensurate rewards may contribute to psychological stress, leading to increased alcohol use among the educated poor.

Lastly, age was not a significant determinant of alcohol use, though older individuals were more likely to quit, likely due to health concerns or changes in social roles.

5. Conclusion

The study yields a number of insights into the demand for alcohol among the poor in Ibadan metropolis in Nigeria. From the findings, the study concluded that the poor are more into alcohol in Ibadan metropolis. In addition, most consumers of the goods are the poor elites and they know the consequences of drinking to health issues. More so, there are evidences from this study that income is not a determinant among the poor. This is because an increase in personal income of the consumers does not significantly imply that consumption of alcohol will increase. Based on the findings of this paper, it is recommended that policy targets should not separate the literates from illiterates when it comes to policies on drug abuse and prevention programs among the poor. The general believe that consumers of alcohol are illiterates among the poor has been debunked by this study as the level of an individual's education has nothing to do with his/her consumption of alcohol. Also, since the demand for alcohol is ostentatious goods, therefore the need for moral adjustment campaign involving all social actors such as: individuals, businesses, associations, voluntary organizations and the governments should be encouraged. More so, National Orientation Agency (NOA) is known for propagating and promoting the spirit of dignity of labour, honesty and commitment to qualitative production and consumption of commodities. Therefore, the National Orientation Agency should focus its campaign and sensitisation against the use and abuse of alcohol consumption among the shanty populace.

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