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Research Article

Price and Income Elasticities of Demand for Alcoholic Beverages in Mozambique: Analysis Based on Household Consumption and Expenditure Survey (HBS 2019/20)

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Abstract

The consumption of alcohol and its impact on people's health and society is a topic of great interest to scholars, policy makers and the public. Numerous global studies have estimated the demand elasticity of price and income for alcoholic beverages, acknowledging the economic nature of alcohol as a commodity and its susceptibility to price and income factors. However, research conducted in Mozambique, on alcohol consumption, primarily examines vulnerable groups' consumption patterns and perceptions of alcohol as a public health issue. The other focus of the studies is the prevalence of consumption in population. Therefore, as we know, there are no studies that focus on demand of alcohol beverages in Mozambique. The current study aims to contribute to fill this gap of information, contributing for a better understanding of the impact of prices and income on the consumption of alcoholic beverages in Mozambique, by estimating the demand elasticities based in four categories of alcoholic beverages (beer, wine, spirits and homemade beverages). The study used data from the fifth Household Consumption Expenditure Survey (HBS 2019/20) carried out by National Statistics Institute of Mozambique. The Almost Ideal AIDS Demand System (AIDS) and the Seemingly Unrelated Regressions (SUR) approaches were used to estimate the demand elasticities. The results reveal that the beer is price and income elastic, while other types of alcoholic beverages are price and income inelastic. Thus, the consumers of wine, spirits and homemade alcoholic beverages are much less sensitive to price and income variations than the consumers of beer.

Keywords

Drinks, Demand, Almost Ideal Demand System, Consumption

1. Introduction

Alcohol consumption is closely linked to economic and societal factors, and it has often been associated with some aspects of culture for thousands of years [18]. The consumption of alcohol and its impact on people's health and society is

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a topic of great interest to scholars, policy makers and the public. Worldwide a number of studies have be taken to quantify the impact of prices and income on the consumption of alcoholic beverages. The great interest in studying aspects related to the consumption of alcohol is based in the understanding that it is one of the risk factors for diseases and social harm [11, 20].

The results of the studies indicate that the demand of alcoholic beverages may be either elastic or inelastic to price and income [2, 1, 31, 32, 8]. The results depend on the data used, the model and statistical technique used, and the country of study.

The research from Australia using time series data on consumer price indices and per capita consumption of alcoholic beverages from 1975/76 to 1998/99, applying Almost Ideal Demand System (AIDS), found that the short-run demand for beer, wine, and spirits was price inelastic [8]. This implies that changes in price had a relatively small impact on the quantity demanded for these alcoholic beverages.

Their study also examined the cross price-elasticities between the four types of alcoholic beverages, and found that wine and spirits were substitutes. On the other hand, wine and beer were complements. Furthermore, their study revealed that wine was considered a necessity good in the short run. However, in the long term, wine was classified as a luxury good, suggesting that as income increased, the demand for wine increased at a proportionally higher rate. Additionally, the study observed a tendency towards an increase in the consumption of wine and spirits over time, while there was a downward trend in the case of beer consumption.

The research results from Brazil, using AIDS model data from Household Consumption and Expenditure Survey carried out in 1995/96, 2002/03 and 2008/09, reveal that wine and other alcoholic beverages were price inelastic. In contrast, beer were price elastic. In other hand, all three types of alcoholic beverages were income inelastic. The cross-price elasticities showed a complementary relationship between wine and beer. In difference, beer and other drinks were found to be substitutes [1].

Another study in Brazil used data from POF 2008 and 2009 and applied the AIDS model [32]. The result of this study revealed that all types of the considered alcoholic beverages had price-elastic. Specifically, a 1% increase in price resulted in a reduction in quantities demanded of 1.5% for beer, 2% for brandy, 2.7% for wine, and 2.9% for spirits. In same study was found that the demand for alcoholic beverages in Brazil was income inelastic, meaning that when income increases by 1%, the quantities demanded increase by a lesser proportion.

Using the AIDS model and data from the Household Budget Survey spanning 2011-2012 in Chile, the data indicated that the own-price elasticities for spirits, wine, and beer were all inelastic. Furthermore, the study found that all the types of alcoholic beverages examined were normal, as reflected by positive expenditure elasticities [2].

A study from the United Kingdom [31], using data from the Living Costs and Food Survey spanning 2007-2012, to estimate own and cross-price elasticities for the major categories of alcohol beverages, including beer, wine, cider, spirits, and 'ready-to-drink' products, found that the price elasticities for beer, ranged from -0.09 to -3.20, indicating that changes in price had a varying impact on the demand for beer. The price elasticities for wine ranged from -0.14 to 2.42, suggesting that the sensitivity of wine demand to price changes also varied within this range. The price elasticities for spirits ranged from -0.08 to 1.60, indicating that changes in price had differing effects on the demand for spirits. The author consider that the wide range of demand elasticities observed in the study can be attributed to various factors beyond price, such as income, licensing restrictions, social and legal factors.

In Mozambique, as we know, the existing studies regarding to alcohol consumption, primarily concentrate on three main areas. Firstly, they examine the perceptions of alcohol consumption as a public health [9, 21, 34, 7]. Secondly, they focus on the consumption of alcohol by vulnerable groups including pregnant women and children [33, 30, 23, 6, 25, 24]. Lastly, investigates the prevalence of alcohol consumption based on social-demographic characteristics of the population [19]. However, there is a notable dearth of comprehensive research specifically addressing the price elasticity of demand for alcoholic beverages in Mozambique.

In light of this, our current study aims to contribute to a better understanding of the relationship between prices, incomes and the consumption of alcoholic beverages in Mozambique. Specifically, we conducted this study to determine the demand elasticities of four categories of alcoholic beverages in Mozambique (beer, wine, spirits and homemade beverages).

2. Production and Import of Alcoholic Beverage in Mozambique

Alcoholic beverages consumed in Mozambique are sourced both national production and through imports. Most alcoholic beverages consumed in Mozambique are national production. Over the years, beer production has dominated the market, accounting for a substantial proportion of national alcoholic beverage production. In addition, from 2019 to 2020 two new breweries started operating in in Marracuene 30 km north of Mozambique's capital Maputo. One have a capacity of 2.4 million hectoliters per year, and with a possibility of expansion to 6.7 million hectoliters per year. The other is located exactly the same city with a capacity of 800,000 hectoliters per year1 (inside.beer, 01.04.2021).

Historically, beer imports held a prominent position in the beverage import structure. Data on production and imports reveal a growing alcoholic beverages market in Mozambique [15, 16]. Most of the imports of alcoholic beverage by

1 Mozambique: AB InBev opens 2.4 million hl brewery | inside.beer - International beverage news from Munich

Mozambique between 2010 and 2022 was from South Africa (60%), Portugal (17%) and the remaining 23% from other countries [16].

3. Methodology

To estimate the elasticities of demand for alcoholic beverages in Mozambique, we utilized data from the fifth Household Consumption Expenditure Survey (HBS) conducted by National Statistics Institute of Mozambique in 2019/2020. The HBS 2019/20 employed probabilistic, stratified and multi-stage sampling methodology encompassing over 13,000 households. The survey results are representative at the national, provincial, urban, and rural areas [14]. These comprehensive sampling techniques provide a robust foundation for analyzing and determining the demand elasticities of alcoholic beverages in Mozambique.

In order to do all analysis necessary, to respond the objectives of the current research, a specific data base file was created, since in the original database, each section was saved as separate file. Therefore, the new database created combined the file related to general characteristics of the household with the expense files, namely, (i) individual daily expenses, (ii) daily household expenses and (iii) own consumption. We grouped the beverages into four categories, "beer", "wine", "spirits" and "home-made". The database includes the values and quantities of each beverage and we obtained the prices residually by dividing values by quantities. Almost Ideal AIDS Demand System and the Seemingly Unrelated Regressions (SUR) approaches were used to estimate demand elasticities.

3.1. AIDS Model Specification

Drawing on the AIDS model, from a specific expenditure function, the analysis takes into consideration various factors to estimate the demand for alcoholic beverages. The model incorporates the expenditure function that enables the determination of the share of total expenditure allocated to different categories of goods including beer, wine, spirits and homemade beverages through the following equation [10].

$$w_i = \alpha_i + \sum \gamma_{ij} \, log \, p_j + + \beta_i \, log \left\{ \frac{E}{P} \right\} \quad (1)$$

Equation 1 represents the specification of the AIDS model developed by Deaton and Muellbauer. Where w_i represents the share of family expenditure on each type of alcoholic beverage, in total expenditure, as the dependent variable; E is the total expenditure on alcoholic beverages; p_j- is the price of each type of drink considered (beer, wine, spirits or home-made); P - is the model TRANSLOG price index;γ_{ij} −is the estimated coefficient for each type of beverage;β_i- is the estimated coefficient for beverage expenditure [10].

TRANSLOG model price index "P" can be defined by equation 2 [4, 5].

$$log(P) = \alpha_0 + \sum \alpha_k \, log \, p_k + \frac{1}{2} \sum \sum \gamma_{kj} \, log \, p_k log p_j \quad (2)$$

But the system equation (2) is nonlinear and often raises empirical difficulties. Therefore, as an alternative, the two above cited studies recommended the use of Stone's geometric index, which results from the sum of the logarithms of prices weighted by their relative income, represented by the expression (3) [4, 5]:

$$P = \sum w_j * ln \, P_j \quad (3)$$

Where w_j represents the share of the budget allocated to each type of alcoholic beverage and P_j is respective price. The AIDS model that uses Stone's index is called "Linear Approximate Almost Ideal Demand" (LA/AIDS), such that equation 1 takes the form:

$$w_i = \alpha_i + \sum \gamma_{ij} \, log \, p_j + \beta_i \, log \left\{ \frac{E}{\sum w_j * log \, P_j} \right\} \quad (4)$$

The AIDS model is subject to the restrictions of adding up, symmetry and homogeneity. The adding up constraint guarantees that the sum of partial consumptions cannot exceed total consumption, which means that Marshallian demands, must satisfy the budget constraint.

$$E = \sum_{i=1}^{n} p_i q_i \; \sum \gamma_i = 0 \quad (5)$$

$$\sum \beta_i = 0 \; \sum \alpha_i = 1 \quad (6)$$

The homogeneity restriction considers that Hicksian demands are zero-degree homogeneous in prices, and Marshallian demands are homogeneous in total expenditure and prices. Likewise, the restriction of homogeneity implies that equiproportional variations in expenditure (E) and prices (p) do not affect demand. In other words, the expenditure on alcoholic beverages does not suffer the effect of monetary illusion [3].

$$\sum_{i=1}^{n} \gamma_{ij} = 0 \quad (7)$$

The symmetry constraint considers that the derivatives of the demand function in relation to cross prices are symmetric, that is, for all $i \neq j$.

$$\gamma_{ij} = \gamma_{ji} \quad (8)$$

The symmetry condition results from the application of Shephard's Lemma to the expenditure function. Shephard's Lemma allows for a precise formulation of the demand for each good in the market in relation to the level of utility and prices. In the AIDS model with the application of the Seemingly Unrelated Regressions (SUR) approach, the symmetry restriction is derived directly from the estimated coefficients (γ).

Several studies concluded that the Marshallian and Hicksian demand elasticities in the LA/AIDS model could be obtained by the formulas 9, 10, 11 and 12, specified below [3, 4, 13].

3.2. Marshallian Income Elasticity of Demand

$$\eta_i = 1 + \frac{\beta_i}{w_i} \quad (9)$$

Where, η_i is income elasticity of demand; w_j is the share of expenditure for each type of alcoholic beverage in the total family expenditure on alcoholic beverage; β_i- is the estimated coefficient for alcoholic beverage expenditure.

3.3. Marshallian Price Elasticity of Demand

$$\varepsilon_{ii} = -1 + \frac{\gamma_{ii}}{w_i} - \beta_i \quad (10)$$

Where, ε_{ii} is price elasticity of demand; w_j is the share of expenditure for each type of drink in the total family expenditure on alcoholic beverage; β_i- is the estimated coefficient for expenditure on alcoholic beverage;;γ_{ii} −is the estimated coefficient of the price of each type of alcoholic beverage.

3.4. Marshallian Cross-price Elasticity of Demand

$$\varepsilon_{ij} = \frac{\gamma_{ii}}{w_i} - \beta_i \frac{w_j}{w_i} \quad (11)$$

Where,$\varepsilon_{ij}$is the cross-price elasticity; β_i- is the estimated coefficient for family expenditure on drinks; $w_j$is the share of expenditure for each type of alcoholic beverage in the total family expenditure on alcoholic beverage; w_j is the share of expenditure on each type of alcoholic beverage in the total expenditure on alcoholic beverage; γ_{ii} − is the estimated coefficient for each type of alcoholic beverage.

3.5. Hicksian Demand Elasticities

$$\eta_{ij} = \eta_{ij}^c - \varepsilon_i \omega_j \quad (12)$$

Where: η_{ij}- is the uncompensated or Marshallian price elasticity of demand;η_{ij}^c- is the compensated or Hicksian price elasticity of demand;ε_i- is the income elasticity of uncompensated demand; w_j- is the share of expenditure on alcoholic beverage j in total expenditure on alcoholic beverage.

4. Results and Discussion

The results reveal that beer dominates the structure of alcohol consumption in Mozambican household, with a share of 63%, and has less price variability compared to wine, spirits and homemade beverages (Table 1). It is plausible to attribute the observed variability in beer prices to the corresponding growth in national beer production [15]. This suggests a potential relationship between the supply of beer and its pricing dynamics.

Table 1. *Descriptive statistics.*

	Share			Price		Values	
Variable	**Sample**	**Average**	**Standard deviation**	**Average**	**Standard deviation**	**Average**	**Standard deviation**
Beer	13,277	0.63	0.11	53.40	12.90	121.42	186.96
Wine	13,277	0.14	0.09	450.00	46.61	450.14	15.99
Spirit	13,277	0.17	0.03	119.00	15.69	121.56	41.65
Homemade	13,277	0.06	0.03	45.98	19.12	43.26	21.98

Source: Authors based on HBS 2019/20

The income elasticities of demand for alcoholic beverages in Mozambique are positive and statistically significant indicating that all types of beverages can be classified as normal goods (Table 2). The demand of beer in Mozambique is income elastic, thus when income increase by 1%, the demanded quantities increases more than proportionally (4.6%). Differently to the beer, the demand of other type of alcoholic beverage considering in this study are income inelastic.

Wordwide alcoholic beverages have become more affordable over time, with income increasing more than prices [18].

In Mozambique, the consumption of alcoholic beverages increases with level of wealth and education [17].

The finding of the current study are in consonance with the results of other studies who plausibly advance that increase in incomes results in a higher purchasing power for individuals, thus enabling them to afford a greater quantity of alcoholic beverages [22, 26]. Thus, consumers perceive alcoholic beverages as more affordable, and allocate a larger portion of their budget towards purchasing these products.

The results in Table 2 show that the uncompensated or Marshallian price elasticities are statistically significant and with a negative sign. The negative sign is consistent with economic theory since the demand curve has a negative slope. The results show that when the price increases by 1%, the quantities demanded reduce, on average, by 1.2%.

Therefore, a 1% increase (or decrease) in the price of beer, generates a greater decrease (or increase) in the quantities demanded of beer, which reveals the Mozambican consumer's preference for beer. In Brazil, a study found that beer consumption increases more with income in families with lower purchasing power and wine consumption decreases with rising income, in poorer families, as well as found the elastic price for beer [32].

For the other types of alcoholic beverages considered in the current study, the demand is price inelastic; thus, when the price increases by 1%, the quantities demanded reduce, on average, by 0.8% for wine; by 0.6% for spirits and 0.7% for homemade.

The results of the current study suggest that the demand for other beverages in Mozambique is much less price elastic than the demand for beer. This means that the consumers of wine, spirits and homemade beverages in Mozambique are much less sensitive to price variations than of the beer. This result could be due to the size of the market for these three types of alcoholic beverages, which is smaller than the beer market.

In the other hand, the results of the inelastic demand for alcoholic beverages when income and prices change were also found in Brazil [1], Australia [8], and Chile [2]. Therefore, the alcohol quantity and quality price elasticities study revealed that drinkers are much less responsive to price in terms of quantity [26], and considering the price, another study reveals that, the demand for alcohol is relatively inelastic [31].

The results of the present study, confirm the trend that drinkers are less responsive to income and price change of alcohol beverage as was found in another study conducted in United Kingdom [31]. Therefore, the current study reveals that, the demand for alcoholic beverages in Mozambique, except beer, is inelastic to price and income, as was found in a study from Brazil [32].

Table 2. *Price and income elasticities of Marshallian demand. Mozambique, 2022.*

	Price			**Income**			
	Elasticity.	**Standard_Error**	**P-value**	**Elasticity**	**Standard_Error**	**P-value**	**Share**
Beer	-1.172	0.010	0.000	4,554	0.010	0.000	0.63
Wine	-0.781	0.015	0.000	0.371	0.001	0.000	0.14
Spirit	-0.601	0.015	0.000	0.528	0.006	0.000	0.17
Homemade	-0.694	0.010	0.000	0.647	0.015	0.000	0.06

Source: Authors based on HBS 2019/20

Table 3 shows the Marshallian and Hiksian cross elasticities of demand. Based on the signs of the results in the table, there are equilibrium relationship between complementarity and substitutability in the Marshallian demand. However, with compensation for income, the complementarity ratio increases from 50% to 75%. Most Marshallian demand elasticities (81%) and Hiksian elasticities (94%) are less than one in absolute terms, which, in a paired analysis, suggests a weak response in the quantities demanded of one type of drink, in response to variations, in the price of the other type.

The cross-elasticities between beer and other types of drinks are all negative, which reveals a complementary relationship, which is more significant when beer is crossed with wine (-2.4). Therefore, theoretically, when the price of beer increases by 1%, the quantities of wine demanded decrease, on average, by 2.4%, *ceteris paribus*. The studies from Australia and Brazil found complementary relationship between wine and beer [8, 1]. The results of the compensated elasticities, in the current study, reveal that there is strong substitution relationship between homemade beverages and beer (3.9%), which means that when the price of one increases the demand of other will increase. This result may be explained by the fact that the two drinks are the most alcoholic beverages consumed in Mozambique, as is indicated by the study conducted in Mozambique [19].

The results in Table 3 indicate high substitution relation-

ship between beer and spirits (0.74) and beer with homemade (3.9). The substitution relationship found might be related with the fact that the two drinks (spirits and homemade) are the less consumed in Mozambique, as is shown in the study of the prevalence of alcohol consumption in Mozambique [19].

Table 3. *Price elasticities of Marshallian and Hiksian cross-demand. Mozambique.*

MARSHALIAN						
		Beer	Wine	Spirit	Home-made	Share
Beer	Elasticities	-1.172	0.05	0.008	-0.143	0.63
	P-value	0.000	0.000	0.216	0.000	
Wine	Elasticities	-2.415	-0.781	1,171	0.042	0.140
	P-value	0.000	0.000	0.000	0.323	
Spirit	Elasticities	-0.67	0.028	-0.601	0.149	0.169
	P-value	0.000	0.000	0.000	0.000	
Home-made	Elasticities	-0.297	0.033	0.015	-0.694	0.060
	P-value	0.000	0.000	0.000	0.000	
HIKSIANA						
		Beer	Wine	Spirit	Home-made	Share
Beer	Elasticities	0.597	-0.053	-0.570	-0.874	0.63
	p-value	0.000	0.001	0.000	0.000	
Wine	Elasticities	-0.645	-0.789	-0.904	-0.972	0.140
	p-value	0.000	0.000	0.000	0.000	
Spirit	Elasticities	0.739	-0.732	-0.643	-0.712	0.169
	p-value	0.000	0.000	0.000	0.000	
Homemade	Elasticities	3,880	-0.247	0.002	-0.708	0.060
	p-value	0.000	0.118	0.955	0.000	
	Source: Authors based on HBS 2019/20					

Table 3 show also that the compensated, or Hiksian elasticities, follow the same performance as the uncompensated demands, most of which are smaller than one (1) in absolute terms. As the Hicksian own-price, elasticity is always non-positive and from the information that alcohol is, a normal and a common good, Marshallian own-price elasticity estimation of alcohol are expected to be more elastic than the Hicksian [12].

The price elasticity of demand has been a central theoretical and empirical issue of those concerned with the control of alcohol consumption for many years [22]. The findings of studies focused on estimated the price and income elasticity of demand for alcoholic beverages have significant implications for government in formulating effective public health policies.

Beer is price and income elastic, which is consistent with the fact that the Mozambican market, according to the Mozambican statistics for production of alcoholic beverages (2011-2022) is dominated by beer. The fact that the consumer of wine, spirits and homemade beverages in Mozambique is less sensitive to price and income variations may be related to the size of the market for these drinks, which is still relatively smaller compared to the beer market [15] and the preference of beer compared to other drinks [19].

The issue of alcoholic beverages in Mozambique is a complex. Therefore, alcohol consumption is considered a public health problem [7]. According to the Industrial Policy and Strategy 2016-2025, the beverage industry is considered strategic for the Mozambican economy, contributing around 13% of the output of the Mozambican industrial sector, behind only the metal industry (35%) and the food industry (25%) [28].

Therefore, there is no legal provision prohibiting the production and consumption of alcoholic beverages in Mozam-

bique. However, there are laws to some extent to control, such as decree no. 54/2013 of 7 October, which imposes restrictions essentially to prevent the early and abusive consumption of alcoholic beverages [27]. Equally, there is also decree no. 36/2023, which regulates the excise duty that is selectively imposed on the consumption of certain goods that are considered luxury, superfluous or harmful to health, such as alcohol, tobacco and cars [29]. The rate for alcoholic beverages varies from 15% to 75% depending on the alcohol content. However, the effectiveness of decree 36/2023 could be jeopardized, among other factors, because article 29 of decree 36/2023, includes benefits of a 75% reduction in taxes paid by industries that use national raw materials to produce the products whose consumption is to be restricted, limited or discouraged.

It is believed that goods that create large negative externalities or social costs, such as those created by alcohol abuse, taxation to reduce social costs is Justified [22]. Externalities and internalities of alcohol consumption can be of several types— traffic accidents, self-injuries, physical violence, property damage—and can extend to additional health care costs in a publicly funded health system [18]. Therefore, in last 10 years (2013-2023) the contribution of excise taxes on total revenue in Mozambique was around 2.2% (Figure 1).

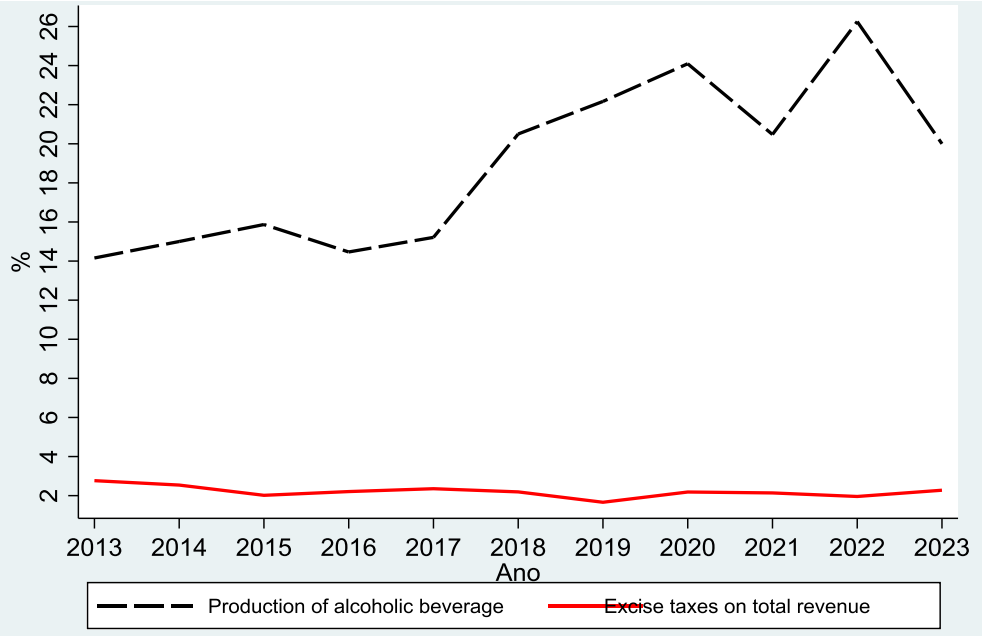

Figure 1. *Share of beverage on industry production and excise taxes on total revenue.*

The 2% contribution to tax revenues means that despite the growth in the production and consumption of alcoholic beverages over time in Mozambique, their contribution to state revenues through excise duties remains residual. These results also suggest that the current rates for alcoholic beverages in Mozambique are not effective in controlling externalities and internalities, either by increasing prices and consequently reducing consumption levels or by increasing state revenues.

However, the low contribution of luxury, superfluous or harmful products through excise duty, to tax revenues, is not unique to Mozambique. The study that discuss how to design excise taxes on alcoholic beverages, suggest that, the low-income countries mobilize the least amount of alcohol excise tax revenue [18]. This suggests that, these countries have significant room for improvement, given the importance of the consumption that escapes alcohol excise taxes and the fact that alcohol consumption increases with income levels [18].

5. Conclusions and Policy Implications

Based on data from the fifth Household Consumption Expenditure Survey (HBS 2019/20) carried out by National Statistics Institute of Mozambique, and applying the Almost Ideal AIDS Demand System (AIDS) with the Seemingly Unrelated Regressions (SUR) approaches we estimate the demand elasticities. The results reveals that the four types of alcoholic beverages (beer, wine, spirits and homemade beverages) are normal goods and therefore, the quantities demanded increase as income increases. Through the same approach, the study results indicate that the demand for beer is income elastic, while the other drinks are income inelastic.

For Marshallian price elasticity of demand for the four types of alcoholic beverages (beer, wine, spirits and traditional drinks) are statistically significant and with a negative sign meaning that when the price increases, the quantities demanded reduce. The demand for beer is price elastic, while others alcoholic

beverages are price inelastic. Thus, the consumers of wine, spirits and homemade beverages in Mozambique are much less sensitive to price variations than the consumers of beer probable, due to the size of the market for these three drinks, which is smaller than the beer market.

Meanwhile, the supply of alcoholic beverages in Mozambique, through production and imports, is increasing, which suggests that there are consumers. Therefore, the results of current study suggest the complexity of controlling the consumption of alcoholic beverages in Mozambique. For example, while beer drinkers are price-sensitive, on the other side, the consumers of higher-alcohol drinks such as wine, spirits and homemade beverages are less price-sensitive. Moreover, there are the substitution relationship between the different types of drinks.

The demand of beer is price elastic suggesting that the consumer of beer is more sensitive to price variation, such that when the prices of beer increases, the consumption will fall. Consequently, the beer consumption may be reduced by polices measure that contributing to increase the prices, for example, increasing excise duty. However, the rise of prices cannot be effective to reduce the consumption of wine, spirits and homemade beverages, because the consumer of these types of alcoholic beverages are less sensitive to change in prices.

Taking in consideration that to have an impact on consumption, excises must increase consumer prices, that is, producers and retailers must not absorb them. Otherwise, increasing taxes and therefore the price of wine, spirits and homemade drinks, which are not very price-elastic, may not affect consumption, but it could potentially increase government revenue by excise duty. However, on the supply side, the same sensitivity to prices could mean that any advertising and promotional measure for beer consumption, which consumers can easily associate with lower prices, could boost beer consumption.

Abbreviations

AIDS	Almost Ideal AIDS Demand System
HBS	Household Consumption Expenditure Survey
SUR	Seemingly Unrelated Regressions

Author Contributions

Sandre José Macia: Conceptualization, Software, Formal Analysis, Validation, Investigation, Writing - original draft, Methodology, Visualization, Writing - review & editing

Carlos Francisco Xavier Filimone: Conceptualization, Formal Analysis, Validation, Investigation, Writing - original draft, Methodology, Visualization, Writing - review & editing

Conflicts of Interest

The authors declare no conflicts of interest.

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