ALCOHOLIC BEVERAGE CHOICE – WHAT MATTERS?

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Abstract

The focus of this paper is to identify certain socio-economic factors, which have an impact on alcohol preferences in Estonia. This is important in designing effective alcohol and fiscal policies.
The analyses are based on a questionnaire (IARD, Washington DC) administered in the Baltic countries in 2016. The paper brings out relationship between preferences of alcoholic beverages (e.g. beer, wine and strong alcohol) and socio-economic characteristic of those consumers groups.
A multinomial logistic regression model allows us to predict the likelihood of a person being allocated to a certain group of consumers of alcoholic beverages.

Keywords: alcoholic beverages, alcohol consumption and policy, consumer choice, excise duties, disposable income

JEL Classification Codes: D12 – Consumer Economics: Empirical Analysis; H2 – Taxation; H3 – Fiscal Policies and the Behaviour of Economic Agents; H310 – Fiscal Policies and the Behaviour of Economic Agents: Household

Introduction

Alcohol consumption as a phenomenon always exhibits many layers. Those layers are related to the choices and health of individuals, social behaviour issues, economic activities and the public budget.

This paper focuses on the factors, which form choice of alcoholic beverage among consumers in Estonia. Certainly, there are many different aspects, which define consumer preferences. Those are based on individual´s characteristics, but also cultural and economic circumstances the consumer lives. Our purpose is to bring out relationship between certain social-economic factors and alcohol beverage preferences in Estonia. Understanding such a relationship is important both for private and public sector.

An individual's choice of beverage defines how often they drink, the amount of alcohol consumed during a drinking event and other factors (e.g. food) related to the process of drinking alcohol.

Those beverage preferences also are often related with profile and scale of the alcohol industry in the country. In turn, these are related to other economic activities (e.g. export-

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activities, tourism related industries, and others). Therefore, it is important to understand the socio-economic factors which lead Estonian individuals to prefer one or another type of alcoholic drink.

Individual structure of alcohol consumption on the basis of alcoholic beverage has been studied previously in EU countries (Alcohol in the European Union, 2012*).* However, the general characteristics of particular alcoholic beverage consumers as distinct groups has not yet been studied. Therefore, the current paper explores, whether any specific features characterize beer, wine or strong alcohol consumers. Such a study is important to understand consumer behavior, which in turn provides important input for alcohol policy design and tax policy actions. For example, one of alcohol policy goals might be channeling persons to consume lower alcohol content drinks – e.g. beer instead of strong liquors. Often tax incentives are used on that purpose. Such a goal cannot be efficiently achieved, if we don´t know, how various consumer groups with different social-economic backgrounds react on relative price changes on alcohol products. Even more, imposing excise duties on alcohol products usually serves also on fiscal, social and healthcare purposes. None of those objectives cannot be accomplished without analysis of factors, which are forming consumers' preferences over range of alcohol products. Therefore, understanding foundations of consumer preferences has a rather practical component for successful economic and social policies. For example, set of such public policies may include regulation of alcohol marketing, shops opening hours, consumption age limits and pricing policies.

Definitely, there is a wide range of individual characteristics, which forms alcohol preferences. In this paper are analyzed certain socio-economic characteristics, which have impact on alcohol consumer. Those are usual features, which are used in such kind of studies. Uniqueness of study is related with specific data, collected purposely from Estonian consumers to assess their alcohol consumption habits.

The paper uses data from the study of Estonian (Baltic) alcohol consumers, conducted by the International Association of Responsible Drinking (IARD, USA) in 2016 (*IARD Homepage*). The study was carried out as a cross-sectional questionnaire study. The respondents to the questionnaire were selected randomly to represent society's demographic structure. Altogether 1,250 respondents were included into the survey sample. The respondents were asked to complete a questionnaire during face-to-face interviews.

Methodological frames

The decision to consume a specific type of alcoholic beverage depends on many factors, including individual and social considerations. There are numerous studies about alcohol consumption, related with various specific individual characteristics or social conditions surrounding a consumer. However, there are no available empirical or theoretical studies, which relate consumer's individual characteristics with their specific alcoholic drink preferences. Therefore, we cannot rely on earlier theoretical foundations on studying individual alcoholic choice preferences.

Nevertheless, we emphasize three aspects, which have impact on person's choice among alcoholic beverages and serve here as a theoretical ground for our study. All those aspects are widely studied empirically and explained theoretically in many countries.

First, an individual choice of alcoholic beverage has been seen to follow a traditional region-based consumption pattern. Those patterns emerge on the basis of the main alcoholic beverage consumed, intensity of drinking, tolerance of public drunkenness and other factors. In other words, individuals drink in a certain way because it is a common social norm and earlier generations have also behaved rather similarly. There have been numerous studies that have conceptualized regional drinking patterns, which are considered below.

Second, public policies and regulations have an impact on which alcoholic beverage individuals choose to drink, and this is related to the context of drinking. This context is made up of a wide range of factors, which all have an impact on a country's particular drinking structure. For instance, consuming alcohol is usually limited to consumers above a certain age, alcohol retailing and marketing is also often constrained and alcohol products are burdened with excise duties. Those duties modify the structure of consumption and channel consumer preferences towards certain types of beverages. For example, wine production (and therefore also consumption) is not burdened with excise duties in many EU countries. Similarly, many countries keep excise duties on beer relatively low compared to other types of alcohol.

Third, alcohol consumption issues are often analyzed over various specific consumer groups. Same methodology used also in the current study. Alcohol beverage choice is analyzed in relationship with particular socio-economic features of consumer groups (Ahlström, 2001, Helasoja, 2007, Klumbiene, 2012, Murphy, 2012). Certainly, there are many ways of constructing consumer groups by alcohol preferences. However, the current study structures the consumer groups on the basis of data, available on the above mentioned IARD study. The socio-economic characteristics of the consumer groups are given below.

What is a regional pattern of alcohol consumption? The most common patterns of alcohol consumption have been grouped under the headings Mediterranean, Central European and Nordic. The Mediterranean pattern of alcohol consumption is one where the main alcoholic beverage is wine, drinking is an everyday habit and public drunkenness is not tolerated. By contrast, the Central European pattern of alcohol consumption is based on a beer culture. The Nordic pattern of alcohol consumption is characterized by drinking strong alcohol, irregular drinking occasions and often excessive or binge drinking. In the same sense, there also exist "wet" and "dry" cultures, separated by the pattern of alcohol consumption (Blomfield, 2003, Ionchev, 1998, Mäkela, 2006 Popova, 2007, Room, 2010, WHO, 2012). In the rapidly globalizing world (particularly in the European context), the drinking habits across regions are undergoing a certain amount of harmonization and unification (Leifman, 2001). Therefore, traditional drinking patterns are starting to lose their distinctiveness. Therefore, researchers are focusing more on specific consumer groups (e.g. based on age or gender) instead of general alcohol consumption patterns.

The Estonian pattern of alcohol consumption has perhaps obtained certain features from neighboring Nordic countries (strong alcohol consumption) and from Central Europe (beer drinking cultures) (Helasoja, 2007, McKee, 2000, Zaborskis, 2006). Therefore, a combination of various consumption patterns exists in Estonia. As one can see below, Estonian alcohol consumption mode a combination of Nordic strong alcohol and Central European beer drinking cultures.

Socio-economic characteristics and beverage choice

To understand the preferences of Estonian consumers in terms of type of alcohol, it is important to recognize their socio-economic characteristics. In the following, I will generalize the characteristics of Estonian consumers' groups. The groups are constructed on the basis of the most consumed beverage, which is measured by pure alcohol (ABV equivalent) on a usual drinking occasion. A selection of the main socio-economic characteristics of consumers commonly used in such studies will be applied here (Ahlström, 2001, Helasoja, 2007, Klumbiene, 2012, Murphy, 2012).

A descriptive overview of the variables is given in tables 1 and 2. The sample in this study includes a total of 1,250 respondents, who are grouped separately by gender. All respondents are divided into groups by their first preferred alcoholic drink. There are three main types of alcohol: beer, wine and strong alcohol or spirits (e.g. vodka and cognac). All other types of alcohol (e.g. alcopops or liqueurs) are transferred to the closest group by alcohol strength (ABV). There are also 235 non-drinkers in the sample, which is 18.8% of the total population.

Table 1 shows drinker's groups characteristics by respondents' location (urban or rural); their monthly disposable income and average alcohol excise duty burden over groups.

As the table indicates, the largest group of respondents in our sample is the group of wine drinking women who live in urban locations. There are much more wine drinkers among women compared to men. Such an outcome is in line with earlier studies (Holmila, 2005; WHO, 2014). The second largest group in the survey is the group of beer drinking men who live in rural locations. At the other end, the smallest groups among alcohol consumers are wine drinking men across the country.

The table presents that strong alcohol consumers have the lowest disposable income compared with wine and beer drinkers. The highest average disposable income is among wine drinking urban men; the lowest income is in the group of strong ethyl alcohol drinking rural women. Such a result correlates intuitively with common understanding, how income and alcohol consumption are related in Estonia. However, there is no earlier studies to compare with.

Excise duties are usually applied to various types of alcohol products. An alcohol excise duty is a unit-based tax and depends on the volume of the particular type of alcohol consumed. Those excise duties define the relative price of the consumed unit of alcohol, which eventually may channel the consumer's choice of beverage. Usually, alcohol excise duties are regressive when compared with incomes (Cnossen, 2011, Craword,

2010, Lowry, 2014; WHO 2014). That means that low-income individuals tend to spend relatively more on alcohol compared with higher income individuals. In turn, the relative price of an alcoholic beverage may also have an impact on beverage choice.

Table 1. Consumer characteristics according to the preferred alcohol type

	Gender	Location, (brackets - number of respondents)	Monthly disposable income, EUR	Total excise in annual disposable income, %
Non-drinker	W[1]	R[3] (67)	706.5	
		C[4] (68)	808.9	
	M[2]	R (58)	763.4	
		C (42)	873.5	
Beer	W	R (63)	727.1	0.3
		C (49)	1040.0	0.2
	M	R (141)	879.8	1.3
		C (98)	1045.3	0.4
Wine	W	R (123)	792.9	0.1
		C (187)	947.3	0.1
	M	R (34)	980.6	0.8
		C (39)	1053.1	0.2
Strong alcohol	W	R (43)	641.4	0.8
		C (46)	642.8	0.9
	M	R (93)	864.37	2.9
		C (99)	979.55	2.5

Source: author's calculations
Notes: 1. W – women; 2. M – men; 3. R – rural location; 4. C – urban (city) location

As Table 1 demonstrates, an imputed excise duty is a relatively small fraction compared with person's disposable income. The group that pays the smallest share of their disposable income as excise duties is wine drinking women; those that pay the greatest share are rural men drinking strong alcohol.

Table 2 continues by describing different groups on the basis of the amount of alcohol they consume annually. The table shows consumption levels in a pure alcohol equivalent (alcohol by volume or ABV) for different types of alcoholic beverages. This is a standardized measure to estimate alcohol consumption over various types of alcoholic beverages.

Table 2. Consumer characteristics by preferred alcohol type

	Gender	Location (number of respondents)	Total pure alcohol, ABV, litres	Beer, ABV annually, litres	Wine, ABV annually, litres	Strong alcohol, ABV annually, litres
Beer	W[1]	R[3] (63)	2.77	2.55	1.04	
		C[4] (49)	1.93	1.62	0.77	1.12
	M[2]	R (141)	9.46	8.96	3.09	2.40
		C (98)	4.69	4.30	1.52	2.90
Wine	W	R (123)	1.06	0.06	0.97	0.52
		C (187)	1.52	0.09	1.32	1.32
	M	R (34)	5.50	1.07	4.25	3.04
		C (39)	2.78	0.54	2.16	1.32
Strong alcohol	W	R (43)	3.15	0.21	1.80	2.41
		C (46)	3.91	0.10	2.05	3.27
	M	R (93)	12.74	2.36	2.70	10.39
		C (99)	11.63	1.44	5.12	9.71

Source: author's calculations
Notes: 1. W – women; 2. M- men; 3. R- rural location; 4. C – urban (city) location

The table presents various characteristics of alcohol consumer groups. First, across all categories of alcoholic beverages, women drink considerably less than men on the scale of pure alcohol. Such a result correlates with numerous earlier studies. (Chaiasong, 2018; Holmila, 2005; WHO 2014; Wilsnack, 2000).

Second, highest amount of pure alcohol is consumed as strong distilled alcohol – both by men and women groups. That demonstrates closeness of Estonian alcohol consumption pattern to the Nordic one, which was explained above. The lightest total alcohol consumers are female wine drinkers, who living in the countryside. The pure alcohol amounts differ more than 10 times between these consumer groups. Men drink considerably more beer than women, particularly in rural locations.

Third, despite the fact that most of the women in the sample belong to the group of wine drinkers, female beer and strong alcohol users consume much higher volumes of pure alcohol (ABV) than female wine consumers.

Fourth, Estonian male rural population tend to consume more alcohol, compared with their urban counterparts (ABV basis).

Usually, individuals do not drink only one single type of alcoholic beverage, but different ones. Structured on the basis of the most consumed type of alcohol, Table 2 presents the average amounts of alcoholic beverage consumed by the different groups. For example, beer drinking rural men also consume on average 3 litres of wine and 2.4 litres of strong alcohol annually (as ABV equivalent). Despite female wine drinkers being the largest group of respondents, their annual alcohol consumption is rather minor – only about 1–1.5 litres of pure alcohol. They do not drink beer in addition, but female wine drinkers located in urban areas also consume strong alcohol alongside their consumption of wine. If we consider typical preferences among Estonian women, this suggests that the strong alcoholic is probably liqueur or cognac instead of vodka or whiskey.

In the next section will be studied quantitative relationship between types of consumed alcohol and individual's socio-economics characteristics.

Model, outcomes and interpretation

In following is developed a model to predict consumer preferences in regard to different types of alcoholic beverages. A standardized multinomial logistic regression model is used to predict (more specifically, to measure the likelihood of the occurrence of) factors significant in choosing one or another alcoholic beverage. In addition, the combined effect of several variables in interaction is calculated. Our focus is to measure various predictors in interaction with consumer gender. In other words, does it make any difference if a consumer belongs to one or another gender when choosing a certain alcoholic beverage?

Those are categorical variables, such as the gender or location (urban or rural) of the respondent. Other variables include age in years, education in years, monthly disposable income in euros, total annual alcohol consumption in litres (calculated on the basis of pure alcohol) and the share of alcohol excise duties compared with income.

Such a model is used when the dependent variable is categorical and there are more than two categories. Furthermore, each independent variable has a single value for each case. In our model, the dependent variable is the type of alcohol – beer, wine or strong alcohol. Although consumers may drink several types of alcohol, the first preference is defined on the basis of the most consumed beverage in terms of ABV equivalent. Independent variables in a multinomial logistic regression may be categorical or continuous. The variables used in our model were statistically described above.

Multinomial logistic models also assume that the dependent variable cannot be perfectly predicted from the independent variables for any case. As with other types of regression, there is no need for the independent variables to be statistically independent from each other; however, collinearity is assumed to be relatively low, otherwise it is difficult to separate the impact of different predictors.

Table 3 presents the parameter estimates of the regression model. The model is statistically significant and goodness-of-fit satisfies the criteria of a good fit for the model

(see model fitness parameters in the table notes). The predictors included here explain 38.8% (pseudo R^2, Nagelkerke) of dependent variable fluctuations.

How should we interpret the outcomes of the model? Table 3 presents the model outcomes according to the principle that one type of alcohol is taken as a reference category (in our case beer). Therefore, wine (I) and strong alcohol drinkers (II) are compared with the consumer group that prefers beer.

The term *significance* is interpreted as usual when using regression models ($p < 0.05$). The interpretation of parameters *B* and *Exp(B)* are explained below following a case-by-case principle.

Table 3. Model parameters

		B	SE	Sig.	Exp(B)
I Wine vs beer group					
	Intercept	-3.51	0.72	0.000	
1	Gender, (women=0; reference group male=1)	2.43	0.45	0.000	11.44
2	Location (rural =0, reference group urban =1)	-0.46	0.18	0.012	0.62
3	Monthly income, EUR	0.00	0.00	0.142	1.00
4	Education (years)	0.07	0.03	0.055	1.07
5	Age (years)	0.02	0.00	0.000	1.02
6	Total pure alcohol, ABV litres	-0.05	0.03	0.081	0.94
7	Total excise in total income, %	4.91	20.55	0.811	135.58
8	Interaction (gender*monthly disposable income)	0.00	0.00	0.288	1.00
II Strong alcohol vs beer group					
	Intercept	-3.47	0.69	0.000	
9	Gender (women=0; reference group male=1)	1.51	0.42	0.000	4.55
10	Location (rural population=0; reference group urban population=1)	-0.48	0.18	0.010	0.61
11	Monthly disposable income, EUR	0.00	0.00	0.000	1.00
12	Education, years	0.01	0.04	0.657	1.01
13	Age, years	0.04	0.00	0.000	1.04
14	Total pure alcohol (ABV)	-0.075	0.01	0.000	0.92
15	Total excise in annual income, %	65.71	11.87	0.000	3.47+28
16	Interaction (gender*monthly disposable Income)	-0.002	0.00	0.000	0.99

Source: authors calculations
Note: R^2=0.388 (Nagelkerke), Chi-Square (df 16) = 387.19; p<0.01

Starting the analyses of the characteristics of wine drinkers (block I) in comparison with the group that prefer beer, the first variable is gender. The likelihood that women (row 1) prefer wine over beer (in the case of this categorical variable, it is also compared with men) is rather clear. Coefficient B is positive and statistically significant. The parameter Exp(B), the odds ratio, tells us that if the respondent is a man instead of woman, the likelihood that the person prefers wine over beer is only 9% (1/11.44=0.087).

The next variable compares preferences based on the regional location of the population (urban vs. rural) (2). Coefficient B is negative and the odds ratio coefficient demonstrates that in the case of changing from a rural to an urban person, the likelihood that the person prefers wine over beer increases.

Monthly disposable income (3) is not a significant predictor explaining a person belonging to the group of wine drinkers instead of beer drinkers. Education level is slightly *off the limit* required for statistical significance (4); however, the coefficient shows that longer educational processes increases the likelihood of preferring wine over beer. Age in years is a statistically significant predictor, with the likelihood of preferring wine over beer increasing as age increases in years (5).

Total volume drunk (in ABV) is not a statistically significant predictor (6); and neither is excise duty in total revenues (7). A person's income and the burden of excise duties does not explain why he or she prefers wine over beer.

The model also measures the combined effect of different variables. How gender interacts with all other variables has been considered. The model output only provides data for those combinations that increase the predictability of the model. Despite the gender variable, taken separately, being a very strong predictor separating drinkers into groups, in interaction with other variables its significance is almost missing. The only combination that produces better model fit is gender in interaction with monthly disposable income (8). However, even in that case as a separate variable in the model, it is not statistically significant. Income does not explain why women prefer wine over beer.

In the following, we consider the group of consumers that prefer strong alcohol (vodka, gin, cognac, other) over beer (section II). When compared with beer, women that belong to the group of strong alcohol consumers are more likely to prefer that option over beer than men (9). Therefore, whatever the first preference among women – wine or strong alcohol – they still favour beer less than men.

Furthermore, among alcohol consumers who prefer strong alcohol, the rural population in comparison with the urban population likely prefer strong alcohol less than beer (10). Therefore, changing from rural person to urban person within the sample, the latter likely prefers strong alcohol 1.6 times more than the former.

In the case of strong alcohol drinkers, monthly income does matter (albeit not statistically significant), when estimating the factors and defining the membership of the consumption groups (11). This means that an increase in income will likely increase the

preference for strong alcohol instead of beer. However, the likelihood is weak as the B coefficient is close to zero.

Education level is not a statistically significant predictor defining membership of the strong alcohol consumption group (12). By contrast, a drinker's age (13) is a significant predictor – if age increases, the consumer is more likely to prefer strong alcohol over beer.

The relationship between alcohol preferences and income is an interesting one. Membership of the group that prefers wine does not depend on income. By contrast, membership of the strong alcohol group shows a statistically significant relationship with income. An increase in income likely causes a person to choose strong alcohol over beer (14).

If you belong to the group consuming strong alcohol, you likely drink less alcohol during a year than those in the group of beer drinkers (as ABV equivalent). Which is a somewhat controversial outcome because strong alcohol consumers drink the highest amount of alcohol in ABV equivalent. One explanation could be that the group of strong alcohol consumers includes those that drink an extremely high volume, and that increases their average consumption disproportionately higher.

If a person is a relatively low-income individual in the group of strong alcohol consumers, he or she likely prefers strong alcohol over beer (15). This conclusion is based on the understanding that alcohol taxes are regressive by nature. There is an extensive list of studies to support that assumption.

However, such a combined effect is statistically significant (16). Our interpretation is as follows: If a person's income increases then it is likely that women prefer strong alcohol over beer less than men. In other words, in line with increasing income, women turn from consuming strong alcoholic beverages to beer.

Summary

The paper brings out relationship between alcohol beverage choice and consumer's socio-economic characteristics in Estonia. That is a practical issue for private sector as well rather instrumental for designing public alcohol and tax policies. Such a relationship has not been analyzed in earlier studies on alcohol consumption. Without clear understanding, what forms consumer preferences over alcohol choice, undoubtedly efficient design and implementation of policies related to alcohol consumption are inefficient.

The study is based on data, collected by IARD in early 2016 (see details above). The dataset allows relate consumers' socio-economic characteristics with their preferences across different types of alcoholic beverage. There is available data about consumer gender, their living area (urban or rural), income, education, age and other socio-economic factors. Other side, there was included into survey questions, characterizing drinking habits – alcoholic beverage type, usual drinking amount per day and frequency

of alcohol consumption. In course of the analyses was constructed multinomial logistic regression model to predict socio-economic factors, which determine preference of alcoholic drinks. As a reference drink was chosen beer; wine and strong alcohol drinkers are compared with beer drinkers.

What are main results of the statistical and econometric analyses?

On the basis on model outcome, the choice of wine over beer depends on consumer's gender (women prefer more wine than beer to compare with men), location (urban population prefer less wine than rural population), education and age. Such predictors as monthly income, total pure alcohol consumption and excise tax burden are not statistically significant factors, which define wine consumption.

What makes whose who strong alcohol different from those, who prefer beer? There is a higher probability, what female consumers prefer strong alcohol over beer; they reside in urban locations and earning slightly higher monthly income than beer drinkers. They are also relatively older age than beer drinkers. In absolute terms, they drink less pure alcohol, but probably spent more on alcohol than those, who prefer beer. Educational level in this case is not statistically significant predictor for alcoholic drink choice. In this case is statistically significant also gender combination with disposable income. Women with higher income tend to drink less strong alcohol than beer.

To conclude, the model allows better to understand and predict alcohol preferences, depending socio-economic differences among consumers' groups. Understanding those differences provides an important input for effective design of alcohol and fiscal policies in Estonia.

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