

# THE BURDEN OF ALCOHOL EXCISE DUTIES IN THE BALTIC COUNTRIES

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## Abstract

The paper comparatively analyses the burden of alcohol excise duties for various levels of income earners in the Baltic countries. Understanding the specific allocation of excise duties across consumer groups is a prerequisite for the efficient design of alcohol policies and taxation strategies. Alcohol excise duties have an impact on alcohol prices, and therefore the social behaviour of individuals and consumption structure in general. Alcohol excise duties are considered to be regressive over incomes. This paper provides a comparative assessment of the relative distribution of the excise tax burden across consumers in the Baltic countries. A correlation analyses and Kakwani indexes are used to measure the regressive characteristics of alcohol excise duties. The statistical analyses are conducted on the basis of a consumer survey carried out in all three Baltic countries in 2015 and 2016.

**Keywords:** alcohol taxation; tax burden; tax progressivity; Baltic countries

**JEL Classification Codes:** H2 Taxation, Subsidies, and Revenue; H3 Fiscal Policies and Behaviour of Economic Agents

## 1. Introduction

Alcohol consumption is a passionate matter in most European countries. It is related to different aspects – from culture to health and from economics to individual liberties. On one hand, drinking alcohol has been a significant part of a nation’s culture and traditions over the millennia. On the other hand, excessive drinking causes tremendous harm to society. The production, distribution and sale of alcohol is a big part of the economy for many countries; alcohol related taxes are an important component of public budget revenue.

This paper will analyse taxation issues related to alcohol consumption in the Baltic countries. Alcohol taxation is acutely important for the Baltic countries because it has a direct impact on the general level of the health of the citizenry, as well as the structure of alcohol consumption, consumer behaviour, social fairness and public budget revenues. Alcohol (over)consumption is still an important issue because of health issues and anti-social behaviour.

Understanding specific factors and regional patterns of alcohol consumption provides valuable input for designing efficient taxation and alcohol policies. Alcohol prices, which in turn, depend largely on taxation, significantly influence alcohol consumption.

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Therefore, a better understanding of the allocation of alcohol excise duties and their burden on consumer groups helps design more proficient alcohol policies in the Baltic countries.

The main research aim of this study is to measure the relative burden of alcohol consumption on the consumer's income in the Baltic countries. This is the first study of its kind, to highlight the alcohol taxation burden comparatively across the region.

Usually, alcohol taxes are considered to be regressive by nature. That is, lower income individuals bear a relatively higher burden in comparison with their incomes. Based on that common academic understanding, how regressive the alcohol excise duties actually are in all three Baltic states is measured comparatively. To assess the burden of the excise tax allocation, various statistical methods are used, including correlation analyses and Kakwani indexes, which specifically make it possible to measure the regressive extent of the coefficients of the excise duties.

As no similar studies have been conducted earlier, the current study identifies valuable aspects related to the allocation of the taxation burden on society.

The analyses draw on an extensive database collected in the course of a survey conducted via *face-to-face* interviews in the Baltic countries in 2015 and 2016. The survey was led by the ICAP (International Centre for Alcohol Policy, now renamed International Association for Responsible Drinking, (see IARD). Altogether, the survey included 3,777 respondents from the Baltic countries.

To identify the burden posed by alcohol excise duties, Baltic consumers are characterised by different socio-economic indicators. Those characteristics allow us to generalise their specific consumption pattern and assess the potential impact of alcohol taxation on different consumer groups.

The current analysis is based on the understanding that alcohol consumption patterns are usually related to specific regional characteristics (Blofield, Stockwell, Gmel and Rehn, 2003; Ionchev, 1998; Popova, Rehm, and Zatonski, 2007). Those characteristics are described according to the most common drink consumed in society; the frequency and amount of alcohol consumed by different groups and general attitudes in society towards alcohol consumption. General attitudes include tolerance of women and youth drinking, and the acceptance of public drunkenness and binge drinking. The Baltic countries share a geographical closeness, historical ties and similarities in economic profile, making them a distinctive region of alcohol consumption. Historically, the Baltic countries have been located at the intersection of various regions of Europe. They have been influenced by Northern European and Russian vodka drinking customs as well Central European beer drinking habits. Integration with European societies has unified drinking habits among the Baltic nations (Alcohol in the European Union, 2012; Helasoja and others, 2007; Leifman, H.2001).

Drinking patterns are always somehow related to the country's regulatory environment. That environment is focused on the physical accessibility of alcohol products (e.g. drinking age limits and the opening hours of alcohol shops) or economic restrictions (e.g.

taxes and price regulations). One of the features of the regulatory environment is alcohol related taxation. If we break down the retail price of alcohol, one of the largest parts of the retail price consists of different taxes.

There are various types of taxes imposed on alcohol production and sales. One of the taxes applicable to alcohol products is a *per unit* tax, which is usually called the excise duty. This tax is imposed on a specific unit of the product (e.g. per hectolitre on certain types of alcohol product). Alcohol excise duties are not related to the product price, but certain physical characteristics of the alcohol beverage (e.g. volume or strength of the beverage). Alcohol excise duty is typically a kind of *Pigouvian* tax, which is mainly intended to correct undesirable social outcomes or negative externalities (Diamond, 1973; Griffith et al., 2017; Pigou, 1920; Sornpaisarn et al., 2017).

Another type of tax applicable to alcohol products, is the standardised sales taxes or value added taxes (VAT). Those are classified as *ad valorem* taxes – they are imposed on the basis of the value (price) of the product.

Different alcohol related taxes are usually combined simultaneously. However, our study focuses only on excise duties and considers VAT taxes as a given.

The paper is structured in the following manner. A short introduction to the theoretical foundations of alcohol excise duties is given in section 2. The overview is partly based on the author's earlier paper on alcohol taxation (Trasberg, 2017).

Then alcohol consumption in the Baltic countries will be presented on the basis of consumer groups and in terms of intensity of consumption, beverage preferences and spending on alcohol products (sections 3 and 4).

Section 5 conducts a correlation analysis between disposable income and attributed excise taxes. Finally, section 6 reports on a Kakwani index to measure the burden of alcohol excise duties across income groups in the Baltic countries.

## **2. Alcohol excise duties: Theoretical aspects**

The first and most important reason for imposing taxes is revenue collection. The largest single contribution to public revenue in EU countries is from labour taxes; consumption, wealth and capital taxes contribute the other half.

Despite the fact that alcohol production and consumption are usually both heavily taxed in most European countries, their share in the total public revenue is rather minor – on average less than 1% of public sector revenue. Why do governments impose specific taxes on alcohol in the form of excise duties? Our focus here is only related to excise duties, which is a common instrument in alcohol taxation.

First, it has been a common tradition over the centuries to collect taxes from alcohol production, sales and consumption (Blocker, Fahey and Tyrrell, 2003). Over the centuries, the justification for taxing alcohol has changed – from just exercising a position of power to social or regulatory motives in more recent times. Usually, producing alcohol

and selling it is simply controlled and the taxation base is easily understandable for all parties involved (Cnossen et al., 2011; Sornpaisarn et al., 2017).

Second, an alcohol excise duty is considered to be a kind of compensation, which partly covers the social harm caused by (excessive) alcohol consumption. As mentioned, alcohol excise duty is a kind of *Pigouvian* tax, the purpose of which is to limit activities that cause negative externalities and harm to society.

Third, alcohol excise duty is considered to be a regulatory instrument, which helps form socially preferable patterns of alcohol consumption. Different exercise duties on various alcohol products shape consumption preferences on the basis of types of alcohol and the amounts consumed. Alcohol excise duties are used to structure the consumption of alcohol and perhaps the alcohol consumption culture in general (Sornpaisarn et al., 2017; Smith, 2005).

Fourth, alcohol excise duties are efficient fiscal instruments for collecting public tax revenues. They are relatively simple to administer, products are easy to identify, there are few producers and the product is relatively price inelastic (Cnossen, 2011, p. 279).

One specific issue in regard to alcohol excise duties is the relative taxation burden over different income groups (Lowry, 2014; Lyon and Schwab, 1995; Levell, O'Connell and Smith, 2016; Trasberg, 2017).

It has been noticed that lower income consumers pay a relatively larger share of their income when purchasing alcohol, than wealthier consumers. That is a problem with the regressive nature of alcohol taxation.

Alcohol is an addictive product and often consumed despite the individual's rational understanding. Individual consumers often spend more on alcohol than socially tolerable or rational. Taxation makes alcoholic beverages more expensive and in this context, the burden of alcohol taxation, "may be borne disproportionately heavily on poorer households" (Crawford, 2010, p. 327; Kesselman and Cheung, 2004).

In turn, high levels of spending on alcohol products may take place at the expense of other, socially more beneficial goods. Therefore, consumers distribute their limited budget over a set of goods, which conflicts with individual health conditions and social rationality (Sornpaisarn et al., 2017; Smith, 2005; Trasberg, 2017).

Also different authors (Crawford, 2010; Potreba, 1989) measure various aspects related to the regressive nature of alcohol taxation. Studies have considered the regressive characteristics of alcohol duties over the life-span of consumers or in correlation with their current income and actual spending (Levell, O'Connell and Smith, 2016).

A common understanding prevails among economists that using alcohol excise duties puts a relatively larger taxation burden on lower income earners compared with higher income members of the population. Whether such a comprehension also holds in the Baltic countries will be highlighted below.

### 3. Baltic alcohol consumption

Alcohol consumption has a long history in the Baltic countries. According to WHO data, the Baltic nations drink heavily, both in the European and the global context (see Table 1).

**Table 1. Alcohol market and consumption, 2016**

	Estonia	Latvia	Lithuania	Finland	Sweden
Recorded alcohol consumption, litres per capita (age+15)	10.3	10.8	14.0	8.5	7.2
Share of alcohol excise duties revenue in general government total revenue, %	2.5	2.0	1.8	1.2	0.7
Total government alcohol revenue per capita, EUR	158	78	90	249	152

*Source: Alcohol Market, consumption and harm in Estonia Yearbook (2016). WHO homepage*

The public budgets in the Baltic countries depend rather significantly on revenues from alcohol excise duties. Excise revenues in state budgets are the highest in the European Union. In Estonia, the government collects about 3% of all budget revenues from alcohol excise duties. On average, this figure in the EU countries is considerably lower.

At the same time, in absolute terms, the alcohol excise revenues per capita in the Baltic countries are generally lower than in the Nordic countries.

The following considers the intensity of alcohol consumption in the Baltic countries. Table 2 demonstrates the amount and frequency of alcohol consumption in the Baltic countries.

**Table 2. Intensity of alcohol consumption in the Baltic countries, 2016**

	% of total respondents			% of total alcohol consumed			Mean consumption, pure alcohol, litres		
	EST	LAT	LIT	EST	LAT	LIT	EST	LAT	LIT
Intensive (every day or 6 times a week)	3.7	4.1	4.6	24.1	32.3	25.9	32.0	34.6	23.5
Moderate (1–4 times a week)	24.4	21.7	23.9	58.3	51.1	55.0	11.6	10.3	9.6
Occasional (1–3 times a month)	36.0	39.3	37.4	15.7	14.9	17.2	2.1	1.6	1.9
Rare (1–11 times a year)	26.5	24.5	29.4	1.9	1.7	2.0	0.3	0.3	0.3
Never	9.4	10.4	4.8	0.0	0.0	0.0	0.0	0.0	0.0

*Source: author's calculations*

As Table 2 shows, about 90% of Estonian and Latvian respondents consume alcoholic beverages during a year (in Lithuania 95%). However, only 4–5% of the population drink almost every day. Approximately, one-third of the population drink 1–3 times a month; occasional drinkers (once a month) cover about one-quarter of all respondents. Such a division of consumers is similar across all three Baltic countries.

The picture looks quite different if we consider the amount of alcohol consumed on the basis of consumer groups. Heavy drinkers consume about 24–32% of all alcohol used. By contrast, occasional drinkers (who represent a quarter of all respondents), consume only 2% of all alcoholic beverages consumed. In reality, the largest amount of alcohol is consumed by those who drink 1–4 times per week. They are what we can call typical drinkers. They make up about 22–24% of all respondents and they consume more than half of all alcohol consumed.

The last column in the table indicates alcohol consumption on the basis of pure alcohol equivalent. All alcoholic beverages (e.g. beer, wine and strong ethyl alcohol) are converted into units of pure alcohol. Intensive drinkers consume as much as 24–35 litres of pure alcohol per year. In other words, this is approximately one shot of vodka (40 millilitres) per day. Moderate drinkers consume an amount equals to about 10 litres of pure alcohol per annum.

To summarise, the following aspects are emphasized. First, alcohol consumption in the Baltic countries is structurally rather similar in terms of the amount and frequency consumed. Second, the highest volumes consumed is rather concentrated in minor consumer groups – 26–28% of the population (one-quarter) consume more than 80% of total alcohol consumed. By contrast, one-third of the population drinks rarely or not at all.

One of the most important features of alcohol consumption patterns is also frequency of consumption. As Table 2 indicates, most of the population do not drink alcohol every day. There is no visible Mediterranean approach to alcohol, where drinking alcohol is a daily habit. In the Baltic countries, more than half of all alcohol is consumed by those who drink only a few times per week. Therefore, the Baltic approach to drinking involves weekly episodic drinking, which often leads to excessive consumption or binge drinking.

The following table (Table 3) presents the structure of alcohol consumption by type of alcohol. The table shows the first choice of beverage per drinking occasion. About 5–10% of drinkers also consume some other type of drink per occasion. The mean value demonstrates the consumption of each specific beverage over all consumed drinks. The indicator “Percentage of total amount consumed” shows how much that specific beverage is consumed by those who select this beverage as their first option.

**Table 3. Consumption by drink structure**

		Estonia	Latvia	Lithuania
Beer	First choice among all drinkers	44.6	41.0	37.5
	Mean, pure alcohol litres	5.06	5.34	4.70
	% of total amount consumed	96.1%	94.1%	99.6%
Wine	First choice among all drinkers	37.1	31.5	31.5
	Mean, pure alcohol litres	1.31	0.94	1.94
	% of total amount consumed	60.0%	82.1%	97.5%
Spirit	First choice among all drinkers	18.4	27.5	31.0
	Mean, pure alcohol litres	7.16	6.70	4.40
	% of total amount consumed	60.5%	86.0%	69.2%

*Source: author's calculations*

The first choice beverage across the Baltic countries is beer (38–45 per cent of all consumers prefer that beverage). Those that prefer beer drink almost all the beer consumed during a year and on average that makes 5 litres of pure alcohol per year. This is like drinking a small beer every day.

The second choice is wine (about one-third of the drinking population). However, the amount of pure alcohol equivalent consumed by wine drinkers is much smaller than the same figure for beer or vodka drinkers. There is an interesting difference between

consumers across the Baltic countries. In Estonia, wine drinkers consume about 60% of total wine consumed. In Lithuania, that indicator is close to one hundred per cent. In other words, Lithuanian consumers drink beer or wine only, but Estonians consume different drinks during a drinking occasion.

In Estonia about 18% of all consumers prefer strong alcohol as their first choice; in Lithuania the same figure is 31% of all consumers. Despite the fact that those in the population that prefer vodka as their first drink are the smallest group in Estonia, they consume on average the greatest amount of all spirits as a pure alcohol equivalent. By contrast, this group in Lithuania consumes even less than those that prefer beer (on a pure alcohol basis).

#### 4. Alcohol tax rates and spending

During the period considered in this study, the alcohol excise duties in the Baltic states were significantly lower than in the neighbouring Nordic countries (Table 5). Excise duties in the Nordic countries being 4–5 times higher than in the Baltic countries. Except for wine products, beer and ethyl alcohol excise duties are also higher than the EU minimum levels in all Baltic-Nordic countries.

**Table 5. Alcohol excise duties, 2016, EUR**

	Beer, per hl/degree of alcohol	Wine, per hectolitre	Ethyl alcohol, per hectolitre of pure alcohol
Estonia	8.3	111	2,172
Latvia	4.2	74	1,400
Lithuania	3.4	78	1,353
Finland	32.0	339	4,555
Sweden	20.7	269	5,456
EU minimum level	1.87	0	550

*Source: Excise Duty Tables, European Commission (2016)*

Lower excise duties may allow countries to maintain lower retail prices, which in turn, often generates harmful cross-border shopping tourism in neighbouring countries. The Baltic countries are commonly known among the Nordic countries as a shopping destination for cheaper alcoholic beverages. The most obvious example here is the intensive cross-border alcohol shopping by Finnish tourists in Estonia.

There are also significant differences in excise taxes between the Baltic states themselves. Estonian excise duties are clearly higher than in neighbouring Latvia and Lithuania. A sharp increase in excise duties in 2017 in Estonia caused alcohol price hikes and “beer tourism” to nearby countries where alcoholic beverages are cheaper.

How much do Baltic societies spend on alcohol and how much do they spend on excises? As Table 6 depicts, consumers in the Baltic countries spend about 19–39 euros per month



on alcohol. That is less than 10% of the monthly income for all income groups. In absolute terms, the sum is not significant; however, about 8% of total income spent on alcohol in Estonia and Latvia in the lowest income segment is a relatively high proportion. The higher the monthly disposable income, the less the relative spending on alcohol in all Baltic countries. In absolute terms, the higher income earners spend more on alcohol than lower income earners. In Estonia and Lithuania, the highest income group spends twice as much on alcohol in comparison with low-income earners.

**Table 6. Monthly spending on alcohol**

Country		Mean monthly spending, euros	Alcohol spending in disposable income	Excise paid annually, euros	Excise duties in income
Estonia	0–500	21.7	8.4%	57.4	1.70%
	500–900	29.4	4.4%	57.0	0.73%
	900+	38.1	3.5%	68.1	0.50%
	Total	30.4	5.2%	61.2	0.95%
Latvia	0–500	18.7	7.8%	35.3	1.32%
	500–900	19.6	3.0%	28.2	0.33%
	900+	21.1	2.0%	31.7	0.23%
	Total	19.5	4.8%	32.4	0.76%
Lithuania	0–500	19.3	5.7%	17.9	0.41%
	500–900	26.3	3.7%	35.9	0.42%
	900+	39.9	3.3%	49.0	0.35%
	Total	27.5	4.2%	32.9	0.40%

*Source: author's calculation*

The total annual excise duties paid on alcohol does not exactly correlate with absolute spending on alcohol. The difference comes from the structure of alcohol consumption by types and the different excise duties on alcohol. Spending more on and drinking more of certain types of alcohol does not necessarily mean more excise duties paid. Estonians pay in absolute terms about twice as much in excises than their southern neighbours due to the higher excise levels. However, as lower income earners spend relatively more on alcohol products than higher income earners do, generally their relative burden of excise duties also tends to be higher. Except for Lithuania, Table 6 demonstrates that the excise duty burden declines for higher income groups. It can be argued that alcohol excise taxes are regressive in general; however, the situation is diverse in Lithuania. Such a result is in line with other studies, emphasizing the regressive nature of alcohol excise duties.

## 5. Correlation between tax burden and income

In the following we consider the burden of alcohol excise duties across income groups. Each respondent's excise duty burden is calculated on the basis of the structure and volume of the alcohol they consume. Afterwards the sum of the computed excise duties is divided by the person's annual income. The resulting ratio is a person's relative alcohol tax burden compared with his or her disposable income.

In the following we calculate the correlations between respondent income and imputed alcohol related excise duties for various types of alcohol products (Table 7). Those results are in close association with previous studies, but the coefficients are slightly different since the respondents selected form a slightly different sample (Trasberg and Trasberg, 2017).

**Table 7. Correlations between disposable income and alcohol excise duties, <sup>1</sup> %**

	Total excise duty in income	Beer duty in income, per cent	Wine duty in income, per cent	Strong ethyl alcohol duty in income annually, per cent
EST	-0.154**	-0.298**	-0.104**	-0.091**
LAT	-0.165**	-0.343**	-0.039	-0.124**
LIT	-0.023	-0.178**	-0.029	-0.006

*Source: author's calculations*

*1. Correlation coefficients between disposable income and specific indicators*

*\*\* Correlation is significant at the 0.01 level (2-tailed)*

Table 7 demonstrates that in Estonia there is a statistically significant (negative) correlation between disposable income and annually paid excise duties for different types of alcohol. That is, the lower a person's income, the more that person pays in alcohol excise duties, relatively speaking, compared to his or her annual income. Once again, such a result confirms earlier studies of the regressive nature of alcohol excise duties.

In Latvia excise taxes are even more regressive than in Estonia, except in relation to wine consumption, where the correlation is not statistically significant.

By contrast, in Lithuania the correlation does not demonstrate the regressive nature of alcohol taxes clearly. As highlighted earlier, alcohol consumption in Lithuania goes hand in hand with income. Higher income earners also consume more alcohol. Only beer excise duty is statistically significantly (negatively) related with income.

Considering the correlation results, we can conclude that alcohol excise duties are regressive in Estonia and Latvia, but not necessarily in Lithuania.

## 6. Measuring alcohol excise tax burden

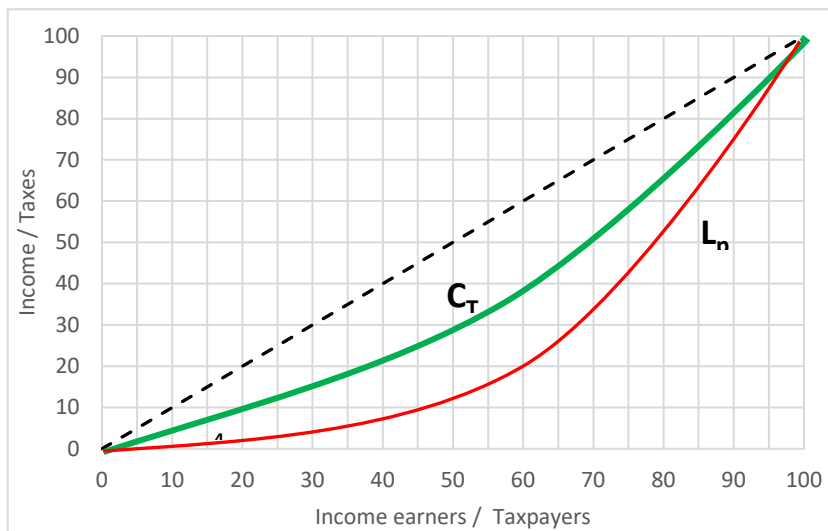
In the following we assess the burden of the excise duty by calculating the Kakwani index ( $K_i$ ). The index was developed to measure progressivity in the tax system across income groups and is founded on a standardised Gini index ( $G_p$ ) and Lorenz curve calculation principles (Kakwani, 1977).

The Lorenz curve is calculated using the following formula, which defines the relative share of income earned cumulatively for a certain share of the population:

$$L_p \left( p = \frac{i}{n} \right) = \frac{\sum_{j=1}^i Y_j}{\sum_{j=1}^n Y_j}$$

The graph cumulatively plots percentiles of the population (income earners) on the x-axis and cumulative income on the y-axis (Figure 1). The dotted diagonal line on the graph represents perfect equality in income distribution across income earners, while the Lorenz curve shows the actual income distribution across the population.

To compute the Gini index, ( $G_p$ ) the area between the dotted line and the Lorenz curve is compared with the total area under the broken line. The higher value of the Gini index is interpreted as higher income distribution inequality.



**Figure 1. Lorenz curve and tax concentration curve**

Similar to the Lorenz curve ( $L_p$ ), the tax concentration curve ( $C_t$ ) is also constructed, as follows:

$$C_t \left( p = \frac{i}{n} \right) = \frac{\sum_{j=1}^i T_j}{\sum_{j=1}^n T_j}$$

The tax concentration curve depicts the cumulative percentage of paid taxes against the cumulative percentage of taxpayers, ranked by income level from lowest to highest.

To calculate the tax concentration index ( $T_p$ ), the area between the dotted line and the tax concentration curve is compared with the total area of under the dotted line. The tax concentration index takes a positive value when the curve lies below the line of equality. By contrast, the index is negative if the curve is located above the line of equality. In the case of a positive index value, the tax is progressive or the tax burden is greater on high income earners. If the index value is negative, the tax burden is allocated more on lower income segments of the population or is regressive. The areas below and above the line of equality cancel each other out.

The progressiveness of the tax burden across groups of taxpayers is measured using the Kakwani index. This is the difference between the concentration index of taxes and Gini index:

$$K_i = T_p - G_p$$

Graphically, the value of the Kakwani index is the area between the Lorenz ( $L_p$ ) curve for income and the tax concentration curve ( $C_t$ ).

The index may take values between -1 and 1. If the index is positive, then the tax burden spreads progressively across taxpayers. In this case, the tax concentration curve is positioned below the Lorenz curve, the index value is positive and the tax is progressive.

If the index value is negative, then lower income earners pay a relatively higher proportion on their income to taxes or taxes are regressive. In this case, the tax concentration curve is positioned above the Lorenz curve, the index is negative and the tax is regressive.

How does the Kakwani index characterise the alcohol excise tax burden across income levels in the Baltic countries? Table 8 provides the value of the Kakwani index for the main types of alcohol.

**Table 8. Gini and Kakwani indices**

	Estonia	Latvia	Lithuania
Gini index (income)	0.285	0.291	0.245
Kakwani index			
Total excise duties	-0.166	-0.454	0.149
Beer excise	-0.231	-0.481	0.087
Wine excise	-0.150	0.158	0.065
Ethyl alcohol excise	-0.141	-0.494	0.177

Source: author's calculations

The standardised Gini coefficient is calculated using the disposable income in each country. Table 8 shows that the Gini coefficient is higher in Estonia and Latvia; in Lithuania income inequality is lower than its northern neighbours. However, here the Gini index is slightly lower than the official data suggests (i.e. *Eurostat*). The reason for such a different outcome is the limited sample completing the questionnaire, which does not include the wealthiest members of society.

As mentioned above, the alcohol taxation burden is considered to be regressive across income groups. Nevertheless, the Kakwani index calculated here presents a rather different situation in regard to the burden of alcohol excise duties across the Baltic countries.

In Estonia, all the computed indices are negative, but the values are not high. That means that alcohol excise duties are regressive for all types of alcohol. Excise duties for beer are the most regressive, while excise duties for wine and strong alcohol are less regressive in comparison with consumer incomes.

In Latvia, the alcohol taxation is even more regressive than in Estonia. However, tax on wine products is spread progressively across all income groups. In reality, wine drinking covers a rather small slice of overall alcohol consumption in Latvia. In a low-income society such as Latvia, drinking relatively highly priced wine is the privilege of higher income groups. As a result, the richer wine-drinking part of society pay relatively more wine-related alcohol taxes.

In Lithuania, all the values for the Kakwani indices are positive. That means that the burden of alcohol excise duties progressively falls on higher income earners. This is a rather unexpected result. The burden of excise duties in Lithuania is comparable to the usual personal income taxation pattern – high income earners paying a relatively higher share of PIT compared with lower income earners. As Table 6 presents, higher income individuals in all three Baltic countries spend more in absolute terms on alcohol than lower income persons. However, it is commonly understood that lower income individuals spend relatively more of their budget on alcohol than higher income individuals. Nevertheless, as the calculations demonstrate, that is not true in Lithuania

(Table 8), as the values of the Kakwani indices are positive. In that country, wealthier individuals spend more on alcohol both in absolute and in relative terms. Perhaps alcohol consumption in Lithuania is characterised as a kind of prestigious form of consumption. That is, wealthier people drink relatively more expensive alcoholic beverages compared with lower income consumers. Such an outcome is definitely a result of different factors – excise structure on different alcohol products, structure and amount of alcohol consumed, social values and many other factors. In any case, the Lithuanian situation is an interesting case for further study.

## **7. Summing up**

Alcohol excise duties influence alcohol price and consumption structure. Consumer behaviour is often irrational from the economic point of view. Eventually, alcohol taxes may generate distortions of the structure of spending, a reduction of social welfare and biases in terms of social fairness. Therefore, the alcohol taxation system should be designed in such a way as to limit harmful over-consumption and compensate for the social cost caused by alcohol abuse.

Many theoretical and empirical studies argue in favour of the regressive characteristics of alcohol excise duties. That means lower income individuals spend a relatively higher amount of their income to pay alcohol taxes compared with wealthier income groups. The regressive nature of alcohol taxation depends on many factors, including the alcohol consumption pattern in a given society, income distribution, the structure of alcohol excise duties and other factors.

This paper assessed the allocation of the burden of alcohol taxation burden across income groups in the Baltic countries. Despite the assumption that the Baltic countries demonstrate a similar pattern in the distribution of the burden of alcohol taxation, a closer comparison highlights a rather different situation.

Correlation analyses demonstrate that there is mostly a negative correlation between income and the burden of various excise duties in income. In Estonia and Latvia, the burden of alcohol excise duties on lower income groups in general is relatively higher or regressive. There is a significant and negative correlation between annual income and excises in Estonia and Latvia; the strongest correlation is between the burden from beer excise duties and annual income. In contrast, there is no statistically significant correlation in Lithuania between income and alcohol excises share in income (except in the case of beer).

The regressive nature of alcohol taxation is also measured by calculating Kakwani indices for various type of alcoholic products. In accordance with other results, the indices show regressive characteristics of alcohol taxation in Estonia and Latvia. In Lithuania, however, the Kakwani index shows that alcohol taxes are slightly progressive over the full range of incomes.

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