Taxation of Beverage Alcohol

BACKGROUND

Beer, wine, and distilled spirits are highly regulated commodities.

Pricing policies, notably through taxation, are applied to alcohol beverages in every country where its sale is legal by national, state, or local authorities, and include value-added tax (VAT), sales tax, excise tax, and tariffs.

One of the main functions of taxation on alcohol beverages is the generation of government revenue.

Income generated in this way can be considerable [2].
• In the United Kingdom of Great Britain and Northern Ireland in 2013, beverage alcohol taxes accounted for 2.2% (USD $16 billion) of government revenue [3].
• In South Africa, 1.6% ($1.4 billion) of government revenue was attributed to alcohol beverage taxes during 2013 [3].
• In 2012, 5.0% ($1.7 billion) of government revenue came from beverage alcohol taxes in Finland [3].

Taxation is also used for trade purposes.
• Taxes and tariffs can be applied to create trade barriers and encourage the purchase of domestic products.

A public health rationale is often cited for the use of alcohol taxation as a policy lever.
• Increases in price are achieved through the imposition of taxes (usually excise taxes) on alcohol with the aim of reducing alcohol consumption, alcohol misuse, and related problems.

For governments, taxation of alcohol, along with other regulatory measures, is relatively cost-effective to implement. As a result, taxation and pricing policies have been proposed as policy “best buys” for governments [4].
• However, in reducing harmful drinking the effectiveness of taxation and other pricing policies depends on the particular national context.
• The assessment of cost-effectiveness, the underlying premises, and their applicability in different countries and under different conditions have been challenged [5].
• Like any measure, taxation is not equally useful in all circumstances, nor can it be applied as a stand-alone tool to reduce harmful drinking.

At the same time, taxation, applied appropriately, is an integral part of a wider regulatory framework around alcohol.

Taxation is most effective in addressing harmful drinking when applied in conjunction with other interventions and tempered by local conditions and context. Key considerations relate to:
• where to set taxation levels to avoid market shifts and unintended outcomes;
• relationships with social and economic factors that influence alcohol consumption and misuse;
• differential effects of pricing policies on consumer groups and drinking patterns; and
• efficacy in markets where regulatory enforcement is poor or the unrecorded market share is large.
SUMMARY OF THE EVIDENCE

Alcohol taxation and consumer demand

Taxation of alcohol beverages is widely implemented as a policy measure to address alcohol-related harm. The underlying assumption is that increasing the price of alcohol will reduce consumer demand, levels of consumption, harmful drinking, and alcohol-related harm.

While consumer responsiveness to changes in price is a basic principle of economics, this relationship is not as clear for alcohol beverages as it is for other commodities that are more homogeneous in nature.

- Alcohol beverages are not a single and undifferentiated product category, and their heterogeneity in type, quality, and price has been implicated in the differential responses to taxation [5, 6].
- In general, demand for beer is less responsive to price than demand for wine, and both are less responsive than demand for spirits [7, 8]; reviewed in [9, 10].
- Research also suggests a wide range of elasticities within single beverage categories [11], meaning that the impact on demand is greater for more expensive products.

Given the range of available alcohol beverages with regard to type, price, and quality, consumers have many choices and options for substituting one product for another in response to price increases.

- Substitution of one beverage category for another has been reported following price increases, from more expensive products to cheaper ones [12, 13].
- Within a single category, substitution may include replacing more expensive beverages with cheaper ones of the same type, often at the expense of quality [5, 13].
- Since unrecorded alcohol (including home-produced, illicitly made or traded, and surrogate) is untaxed, it represents an alternative to highly taxed commercially available beverages [14-21].
- Another form of substitution involves shifting from drinking more expensive on-premise beverages to cheaper off-premise consumption, such as that which takes place in the home [22-25].
- Consumers may also purchase alcohol beverages in bulk at discount rates to offset increases in price [26].

Consumption, patterns, and outcomes

Numerous individual studies, systematic reviews, and meta-analyses have examined the relationship between taxation as a means of increasing the price of alcohol beverages, consumption patterns, and health and social outcomes of drinking.

- Results of these studies are mixed, and vary by population and drinking pattern. In addition, concerns have been raised about methodological issues and publication bias [13].
- Many individual studies have shown a correlation between increased taxation of beverage alcohol and decreased consumption at the aggregate population level [27]. Meta-analyses have shown a similar relationship, as well as a reduction in the aggregate consumption of individual beverage types [28-32].
- Similarly, evidence suggests that reductions in excise tax may be correlated with an increase in consumption [33].
- However, a more recent meta-analysis that controls for outliers and publication bias suggests that responsiveness to price increases is significantly smaller than previously reported [13].

A direct inverse correlation between the level of taxation in a country and the population level of drinking (where taxation increases, consumption decreases) cannot always be demonstrated.

- As Table 1 shows, in some countries with high excise taxes on wine, beer, and spirits, rates of per capita consumption are low. However, in other countries with high taxation rates, per capita consumption levels remain high.
- This suggests that the impact of taxation (and other regulatory measures) depends on other variables, such as drinking cultures.

Drinkers respond differently to increases in taxation and changes in the price of alcohol.

- Although there is a dearth of scientific evidence exploring the effects of taxation on light and moderate drinkers, one study found moderate drinkers to be more responsive to increases in taxation than light and heavy drinkers [11].
- Some studies have reported a correlation between increased pricing and taxation policies and reductions in heavy and other high-risk drinking patterns [27, 35, 36].

While consumer responsiveness to changes in price is a basic principle of economics, this relationship is not as clear for alcohol beverages as it is for other commodities that are more homogeneous in nature.
• However, a weaker relationship was demonstrated between taxation and heavy drinking than between taxation and overall drinking levels, suggesting that taxation does not effectively target heavy drinkers [35]. This supports earlier findings from individual studies [11, 26].
• Other reviews have found that heavy and frequent drinkers (both male and female) are relatively unresponsive to price [37-39], and that it has little impact on heavy episodic drinking among both adults and young people [39].
• There is also evidence that heavy drinkers are most likely to choose cheaper beverages [40] and to trade down in price (and often in quality) when taxes are raised [5, 26, 40].

The evidence on the impact of taxation policies on alcohol-related harm is also mixed, and depends on the particular outcomes measured.
• At the aggregate level, a correlation between increased taxation and reduced alcohol-related morbidity and mortality has been reported [27, 35].

Source: WHO Global Health Observatory Data Repository [3] and OECD Alcohol Taxation [34]

<table>
<thead>
<tr>
<th>Country</th>
<th>VAT Rate (%)</th>
<th>APC (liters of pure alcohol)</th>
<th>HED (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finland</td>
<td>24</td>
<td>8.97</td>
<td>36</td>
</tr>
<tr>
<td>Denmark</td>
<td>25</td>
<td>9.21</td>
<td>29</td>
</tr>
<tr>
<td>Norway</td>
<td>25</td>
<td>6.22</td>
<td>12</td>
</tr>
<tr>
<td>Japan</td>
<td>5</td>
<td>8.07</td>
<td>18</td>
</tr>
<tr>
<td>Switzerland</td>
<td>8</td>
<td>9.66</td>
<td>19</td>
</tr>
<tr>
<td>Australia</td>
<td>10</td>
<td>9.87</td>
<td>11</td>
</tr>
<tr>
<td>Israel</td>
<td>18</td>
<td>2.64</td>
<td>8</td>
</tr>
<tr>
<td>Turkey</td>
<td>18</td>
<td>1.5</td>
<td>0.2</td>
</tr>
</tbody>
</table>

• Data on the impact of increased taxes on violence and crime, however, are mixed with some studies reporting a correlation [27, 35, 36], and others showing no evidence of a relationship, notably with intimate partner violence [41, 42].
• Most studies on the impact of tax increases do not support a significant reduction in liver cirrhosis mortality among heavy-drinking adults [43].

Taxation has also been studied as a tool for reducing consumption and harmful drinking among young people.
• Data indicate that young people are more responsive to changes in price (and taxation) than adults [27, 38, 40, 44-46].
• However, the evidence also suggests that young people who are heavy drinkers may be less responsive to price than those who are lighter drinkers, mirroring findings among adults [38].

Income may play an important role in young people's response to pricing policies.
• It has been suggested that since young people generally have limited disposable income, they are likely to be affected by taxation, particularly if they purchase their own alcohol [47, 48].
• Young people who purchase their own alcohol are also reported as more likely to drink and engage in high-risk drinking behaviors, such as heavy episodic drinking [45, 49].
• However, there is also evidence that many young people do not purchase their own alcohol but obtain it from adults. For them, taxation may be of limited impact as a deterrent [45, 50, 51].

The impact of social, demographic, and economic factors

Empirical evidence suggests that broader social, demographic, and economic factors play a more significant role in shaping drinking patterns than regulatory measures, including taxation and pricing policies.
• An extensive analysis of the effects of alcohol policy measures and socio-demographic and economic variables was conducted on data covering 50 years in 12 European countries [52].
The results of this work show that at the regional, sub regional, and national level, the impact of individual measures was highly variable, but that pricing policies were among those least significantly associated with changes in either alcohol consumption or indicators of harm at the European level [53].

Socio-demographic and economic factors were more strongly correlated with alcohol consumption and harm than were regulatory measures [53].

These findings correspond with earlier reports that taxation rates are not always correlated with predicted increases or decreases in either consumption or alcohol-related harm [33, 54, 55].

Alcohol taxation is regressive and may disproportionately affect the economically disadvantaged.

- The relationship between disposable income and taxation of alcohol has also been discussed in relation to its impact on low-income groups.
- Evidence of a disproportionate burden from alcohol taxes on lower-income households from individual studies is mixed and may depend on other national-level factors [56-58].
- However, there is a relationship between lower-income segments of society and the consumption of untaxed unrecorded alcohol, including surrogate alcohol, reflecting the inability to afford taxed (and higher-quality) beverages [59-64].

**Unintended outcomes**

The decision to implement taxation and other pricing policies must weigh potential benefits of increasing price against unintended outcomes.

- Price is one of the major drivers of consumption of unrecorded alcohol, and high taxes on regulated and branded products can drive trade in unregulated alcohol and growth of the gray or black markets.
- Vigorous cross-border trade has been reported between jurisdictions with significantly different taxation rates and pricing policies [33, 46, 65-70].
- The influx of illegal alcohol and the use of denatured or industrial alcohols in the production of unrecorded beverages have been reported in response to price increases and other restrictions on the regulated market [71].

Increases in taxation rates, particularly where affordability of regulated products is low, can shift both demand and supply to less expensive and potentially harmful substitute products.

- In Russia, untaxed homemade samogon is consumed at a rate of almost five times that of taxed vodka in some regions. Its cost ranges from one-quarter to one-half the price of legal and commercially available vodka [21].
- Cheap and harmful alternatives to commercial products include non-potable surrogate alcohols (e.g., medicinal compounds, automobile products, and cosmetics) or drinks that are mixed with them [21, 72, 73].
- Methanol is often present in cheap products and has severe reported health outcomes [74].
- In Estonia, increases in taxation raised the price of formal commercial products by 45%, making them largely unaffordable. As a result, an increase in consumption of surrogates was reported by the most socially disadvantaged members of society [73].
- Conversely, pricing liberalization in Sweden has increased domestic purchases of commercial products and reduced the estimated consumption of homemade beverages five-fold [67].

**LIMITATIONS AND METHODOLOGICAL ISSUES**

Certain limitations should be taken into account with respect to the available evidence on the utility of taxation policies as public health tools.
The evidence pointing to the effectiveness of taxation policies to reduce harmful drinking is increasingly being challenged by new studies that offer a more nuanced analysis of the complex relationships.

- Earlier work around the impact of taxation relies largely on aggregate consumption measures, such as per capita consumption and population-based indicators, obscuring the variations in impact within populations and across drinking patterns.

Taxation as a policy tool has been studied mainly in developed countries, particularly those in Northern Europe, North America, Australia, and New Zealand. Its utility in developing countries is largely unproven.

The effectiveness of control policies, including taxation, relies on adequate enforcement [75, 76]. The enforcement of regulatory measures is often weak in developing countries, and, as a result, the impact of such measures may be more limited [10, 75, 76].

- Many developing countries have particular drinking patterns, including larger proportions of abstainers than developed countries, also suggesting a more limited impact of taxation policies [10, 77].
- Wide availability of cheap unrecorded alcohol in many developing countries also poses a significant challenge to taxation as a measure for limiting consumption [18].

Much of the evidence for taxation as a health policy tool are based on predictive models and projections of outcomes, and are rarely backed by empirical evidence.

- A large portion of the literature relies on predictive studies of the likely impact of changing taxation and price of alcohol on consumption per capita and other indicators of harm (e.g., road traffic crashes, liver cirrhosis, suicide, violence) [35, 67, 78-80].
- Recent analyses of empirical data show that the relationship is less predictable and considerably less compelling than previously assumed [53, 55, 81].

Changes in consumption following policy measures may be the result of natural trends and may occur independently of the introduction or removal of taxation (or other) policies.

- Following the reform of taxation on spirits in Switzerland in 1999, there was a 30–50% reduction in the retail price of imported products. The immediate impact was a 30% increase in spirits consumption, although total consumption across all beverage types remained the same [82].
- The institution of a tax on alcopops in Germany in 2004 resulted in a decline in consumption of these types of products; however, a similar decline was observed in Austria without the institution of a tax [83].
- There has been a steady decline in alcohol consumption in many European countries over the past 30 years, which has occurred independently of taxation policies [84].

Assessments of consumer responses to taxation depend on the methodology used and are influenced by additional factors.

- For example, the magnitude of the effect of changes in price depends on whether individual- or aggregate-level data are used [7, 9, 30, 35].
- Systematic reviews and meta-analyses that are used to build the evidence around particular measures, including taxation, are shaped by the quality of the underlying studies they consider. Several methodological issues may obscure study findings, if not taken into account, including [13, 43]:
  - publication bias;
  - heterogeneity of effect sizes; and
  - outliers.

Interpretation of the impact of taxation on outcomes needs to take into account other policy and prevention measures that may have been implemented concurrently.

- In developed countries, tax increases are often accompanied by other alcohol control policies such as restricting youth access, refusing sales to intoxicated persons, restricting advertising, and targeting drink-driving [10], making it difficult to disaggregate the effect of each policy.
Price elasticity of demand, the ratio of the percent change in demand divided by the percent change in price, is a measure of consumer responsiveness to a change in price of a product or service.

For example, if the price of beer increases from USD $3.00 to $4.50 per 100 ml, and demand for beer decreases from 60 liters to 50 liters per year, then price elasticity of demand for beer is:

\[
PED = \frac{[(50 - 60) / 60]}{[(4.50 - 3.00) / 3.00]}
\]
\[
= -0.167 / 0.50
\]
\[
= -0.334
\]

In the previous example demand for beer is inelastic because the PED < 1.0, meaning that consumers are unresponsive to a given change in price. If, however, demand for beer decreased from 60 to 20 liters per year under the same price change:

\[
PED = -0.67 / 0.50
\]
\[
= -1.33
\]

Demand for beer would be elastic and consumers would be considered responsive to this price change.

REFERENCES


Reviews

*IARD Health & Policy Reviews* cover the effects of alcohol consumption on health. They offer an overview of the relationship between drinking patterns and health outcomes, compile the key literature, and provide the reader with an extensive bibliography that refers to original research on each topic. The *Reviews* attempt to present the balance of the available evidence. They do not necessarily reflect the views of IARD or its sponsoring companies.

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