

# Alcohol Price Regulation in France: Choosing a Reform Scenario to Achieve Public Health and Tax Fairness Objectives

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**Abstract** – Public health authorities advocate the introduction of alcohol pricing policies in the form of tax reform and/or a minimum unit price based on the pure alcohol content of products. We use Kantar WorldPanel household purchase data to describe the distortions in the current tax system, favouring wine and penalising low-income households. We assess the potential impact of reform scenarios that replace current taxes with a single excise tax (flat or progressive) on pure alcohol content and/or the introduction of a minimum price per gram of pure alcohol. Introducing a minimum price while leaving taxation unchanged would have the advantage of raising alcohol prices, especially for low-end wines, which are prized by abusive consumers. The impact would *a priori* be limited in terms of tax regressivity and for higher quality segments, which is important for the wine sector.

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Although alcohol consumption in France has fallen by 50% since the Second World War, it remains at the heart of French food culture and practices. France currently ranks sixth among OECD countries in terms of total alcohol consumption per capita (Richard *et al.*, 2015). Alcohol is a major cause of morbidity and mortality through disease, accidents and violence leading to premature death.<sup>1</sup> Price regulation is a key component of any public policy aimed at reducing consumption (OMS, 2010, Section 16, p. 14; OCDE, 2021; Inserm, 2021). Systematic reviews of the empirical literature show that price increases have a significant negative impact on alcohol consumption and related health outcomes, including in high-drinking populations.<sup>2</sup> In addition to the objective of protecting public health by changing the behaviour of economic agents (consumers, producers), these price increases can be justified by the need to preserve public finances. The social cost of alcohol consumption is estimated at 102 billion euros in 2019 by Kopp (2023). Ninety-six per cent of these costs are external (value of lives lost, loss of productivity and quality of life) and 4% are costs to public finances (equal to the difference between expenditure on prevention, control and care, on the one hand, and savings on unpaid pensions and revenue from alcohol taxes, on the other). This represents almost two-thirds of the annual expenditure of the health branch of the social security system, or more than twice the annual budget of the French education system. However, current alcohol tax revenues do not cover the costs to public finances, let alone the social costs: specific tax revenues, estimated at €4.0 billion (excluding VAT), are far lower than public expenditure (€7.3 billion). In this context, the legislator has two instruments to better regulate alcohol prices: a reform of alcohol-specific taxation; the imposition of a minimum price on the price of a standard drink of pure alcohol (following the example of Scotland or Ireland).

A tax reform should make it possible to differentially target those products for which consumption is associated with greater harm, i.e., those that are consumed relatively more by heavy drinkers (Diamond, 1973; Griffith *et al.*, 2019; Calcott, 2019). However, under the European Treaties, it is impossible to target specific product categories when the harm is associated with one molecule, ethanol. Article 110 of the Treaty on the Functioning of the European Union states that direct or indirect taxation must be the same for similar goods that

meet the requirements of the European Union legislation on the free movement of goods, and that taxation must not serve as indirect protection for other goods. While Article 110 does not affect any tax structure introduced in the past, it does severely limit the scope for reform, as several past cases have shown.<sup>3</sup> Only a reform motivated by a public health objective and proportionate to that objective (i.e. sufficiently effective) can be considered to comply with Article 110. It will therefore necessarily have to target the ethanol content of products. This raises the further question of whether ethanol should be taxed at a single rate (a flat tax) or whether it would be more effective to introduce rates that increase progressively with the alcohol content of the product. Indeed, if heavy drinkers tend to over-consume strong alcohols, a progressive tax could target these products more specifically and thus have a greater impact on externalities and internalities (Griffith *et al.*, 2019).

However, heavy drinkers also tend to switch to lower quality products when faced with price increases. It may then be worthwhile complementing or replacing fiscal measures with a minimum price if it can better target cheap products with high alcohol content. Indeed, the results of an *ex-post* evaluation of the minimum pricing policy implemented in Scotland and Wales show that it led to a substitution of high-alcohol beers and ciders for lower-alcohol products, and that its impact was concentrated in the 20% of households with the highest per capita alcohol consumption, regardless of income level (Llopis *et al.*, 2021).

To our knowledge, there are no studies based on detailed market data documenting the potential benefits for France of these alcohol price regulation policies. We propose to fill this gap with a descriptive analysis using scanner data from the 2014 Kantar WorldPanel (KWP) household panel. These data are used by private companies and certain public institutions (INRAE, France Agrimer) to monitor trends and determinants of food purchases made by French households for their home consumption. Compared with the data from the *Budget de famille* (Household budget)

1. See in particular Bègue (2012) and Ren *et al.* (2021). Alcohol is second only to tobacco as a cause of preventable mortality in France, with a total of 41,000 deaths in 2015, 7% of total mortality (Bonaldi & Hill, 2019).

2. See for example, Gallet (2007), Nelson (2013; 2014), Sharma *et al.* (2016), Wagenaar *et al.* (2009).

3. In Case 243/84, *John Walker* (1986), whiskey and liqueur wines of the liqueur type were held not to be similar products. In Case 106/84, *Commission vs Denmark* (1986), wine made from grapes was judged to be similar to wine made from other fruits. In Case 170/78, *Commission vs United Kingdom* (1980), the introduction of a tax on wine that was five times higher than that on beer was rejected on grounds of the degree of substitution between the two product categories.

surveys, they offer the advantage of providing information on quantities, expenditure and the precise characteristics of the products purchased, in particular their alcohol content. This is crucial for the analysis of alcohol taxation, part of which consists of excise duties (i.e. based on the volume purchased, not the value), which can vary depending on the alcohol category and the alcohol content of products. However, these data do not provide information on consumption away from home, which is higher among younger and higher income consumers. Such consumption is not accurately reported in alternative sources, such as the *Budget de famille* surveys. We discuss the potential consequences of this in the conclusion.

Using these data, we describe the structure of the alcohol market to assess the relevance of current alcohol taxation in terms of public health and tax fairness. We identify the main characteristics of the French market by examining the distribution of purchases across alcohol categories (ciders, beers, aperitifs, spirits, still wines and sparkling wines). This allows us to document the tax distortions that exist in favour of wine and against spirits, given the public health objective of basing taxation on the pure alcohol content of products (ethanol). We also examine the distribution of purchase unit prices to understand the possible effects of introducing a minimum price. In particular, we show that wines, which account for almost 50% of pure alcohol purchases, are sold at very low prices, below 5 euros per litre for 80% of purchase volumes. Finally, we describe the regressivity of the current tax system. In addition to reducing the external costs of consumption, policymakers may wish to incorporate equity objectives into their policy design by minimising their potential redistributive effects. For a same level of consumption (and induced harms), the welfare of a low-income consumer should not be affected more by the tax than that of a high-income consumer. We show that the current tax system is regressive, due to the social inequality in alcohol-related risks – with the low-income consumers buying more pure alcohol overall – combined with a tax system that exempts wine.

Second, we provide simulations of the impact of various pricing policies. These simulations are called accounting simulations in so far as the impact of policies on prices and expenditure is estimated (i) in the case where producers and retailers decide to pass them fully onto consumer prices, and (ii) for unchanged consumption choices. This approach relies on the assumption that the behaviours of economic agents do not change in

response to the pricing policy. Our scenarios are based on the idea of replacing the various specific taxes on alcohol (mainly excise duties and social security contributions) with a single excise tax based on the pure alcohol content of drinks without discriminating between products, and/or with a minimum pricing policy. We calibrate our reforms to achieve either a tax neutrality objective (stability of tax revenues) or an objective of internalising alcohol-related health expenditure, assuming that there is no market reaction.

Our results show that a minimum price policy would offer certain advantages over tax reform scenarios. Indeed, the introduction of a minimum price would inevitably lead to an increase in the price of low-end alcoholic beverages (and wine in particular), which are prized by heavy drinkers, and thus to a reduction in their consumption; the impact on prices would *a priori* be limited or non-existent for the quality brands, which is important for the wine sector. Conversely, implementing a single ethanol-based excise tax would initially lead to an increase in the price of *all* wines and a massive reduction in the price of spirits, which could lead to an unexpected increase in the consumption of pure alcohol. Only a progressive and very high ethanol tax would allow an overall price increase. Finally, the tax burden would increase with a tax reform, to a greater or lesser extent depending on the objective set, and would decrease slightly with a minimum price policy. These effects vary little by standard of living, suggesting that none of these reforms would accentuate the regressivity of current taxation.

The remainder of this article is organised as follows. Section 1 presents our data and the structure of purchases by alcohol category. Section 2 describes the current taxation system, demonstrating the distortions between alcohol categories and characterizing its regressivity. In Section 3, we simulate our pricing policy reform scenarios and show the advantages of a minimum pricing policy over the replacement of current alcohol-specific taxes by a single ethanol-based excise tax. We discuss the scope and limitations of our simulations in the conclusion of the article.

## 1. Data and Structure of the French Alcohol Market

This section presents the data and a few stylised facts describing the structure of alcohol purchases by French households. This will provide a better understanding of the issues involved in a tax reform in terms of impacts on public health and redistributive effects.

## 1.1. Kantar WorldPanel Data

We use household scanner data collected by Kantar WorldPanel (KWP) for 2014. Each year, KWP monitors a sample of more than 20,000 households. Using a hand-held scanner, they record the quantity, expenditure, and barcode of their purchases, including online purchases, for home consumption.<sup>4</sup> A household remains in the sample for four years on average. In 2014, the KWP panel was made up of 24,177 households reporting at least one purchase. KWP considers a household to be inactive if the number of purchases reported is lower than expected based on its past purchases and its socio-demographic characteristics. In addition, only a sub-panel of households reports purchases of products without a barcode and therefore all purchases for home consumption. We use this sub-panel in order to better cover purchases of alcoholic beverages. Of these households, 6,565 have been declared active all year round, i.e. active during at least 10 of the 13 (four-week) periods. They make up what KWP calls the *constant panel*.

From this constant panel, we select the 6,353 households that purchased alcohol at least once in 2014 (96.7% of the constant panel). In doing so, we restrict the analysis to consumers of alcohol, under the reasonable assumption that a reform of alcohol price regulation will be justified by a public health objective and will not have the effect of encouraging households abstaining from alcohol to become consumers. Table S1-1 of Online Appendix S1 (link at the end of the article) provides descriptive statistics regarding some of the socio-demographic characteristics of the households of the constant panel that consume alcohol. The Box discusses the advantages and limitations of KWP scanner data as compared to the 2017 *Budget de famille* survey.

4. No information is provided on alcohol consumption away from home, which accounted for 42% of total individual intake of pure alcohol in 2014 according to the NutriNet 2014 survey (figures provided by Chantal Julia from the Équipe de Recherche en Épidémiologie Nutritionnelle (Nutritional Epidemiology Research Team), whom we would like to thank). For a complementary presentation of these data, see Caillavet et al. (2019).

### Box – What Advantage Does the Use of Scanner Data Provide for This Study?

Since the 2000s, economic studies analysing markets for fast-moving consumer goods and evaluating policies aimed at regulating the consumption of such goods have mainly relied on scanner data. The Kantar WorldPanel (KWP) data we use here have three advantages over data from INSEE's *Budget de famille* surveys (Household budget surveys, BDF). First, they provide information on quantity, quality and expenditure. In the 2017 BDF, information on quantities is only available for 36% of purchases in the consumption diaries given to households, and the categories are too aggregated to allow a precise study of the potential fiscal impact of reform scenarios targeting the alcohol content of beverages. Second, these panel scanner data follow purchases by the same households throughout the year, which limits the observation of zero consumption due to infrequent purchases (Dubois *et al.*, 2022). Thirdly, they allow for very precise measurements of prices (Ruhm *et al.*, 2012). Purchase scanner data are also less likely to be affected by bias due to under-reporting of alcohol quantities than are health data: as the survey does not specifically focus on the risks posed by alcohol, it does not make salient the stigma associated with excessive drinking. However, reporting requires more effort on the part of respondents, which raises questions about the quality of the data in terms of their representativeness and coverage of the population.

All our analyses use the socio-demographic sample weights provided by KWP. These weights are determined using a margin calibration procedure that takes into account the socio-professional and age categories of the reference person, the number of persons in the household combined with the age category of the reference person, the region of residence and the household standard of living. The actual representativeness of the household panel and the quality of the scanner data collected can be questioned, especially in comparison with the BDF surveys. We compared the distribution of the sampling characteristics of households in the Kantar constant panel with that of households included in the 2017 BDF survey (see Table S1-3 in the Online Appendix S1). This comparison shows that the KWP sample under-represents households where the reference person is aged between 50 and 64, as well as managers, intermediate occupations and white-collar workers, and over-represents blue-collar workers and pensioners. Some of the differences between the two data sources can be explained by differences in the way the samples were built-up (Zhen *et al.*, 2009). Young, affluent and dual-income households are less well represented in the scanner data because the survey requires a degree of diligence. Conversely, working-class retired households are over-represented, possibly because they have more free time and because active participation in the survey is rewarded with points that can be converted into vouchers.

However, a comparison of the two sources of aggregated expenditure volumes for categories of alcoholic beverages in the Classification of Individual Consumption by Purpose (COICOP) of the 2017 BDF survey shows that the structure of expenditure observed in our working sample is very similar to that calculated on the basis of the 2017 BDF survey, with, for example, a total expenditure volume of 10.38 billion according to the 2014 KWP data compared to 11.37 billion according to the 2017 BDF survey (see Table S1-4 in Online Appendix S1), with the difference attributed to higher expenditure in unit value among higher income households. Finally, we should note a limitation common to both surveys. They do not allow a precise identification of alcohol consumption away from home. This information is not available in the KWP data we have and is included in the aggregated group 'meals' outside the home in the 2017 BDF survey.

Each line in the database corresponds to a purchase, i.e. the purchase of one or more identical products at the same time and in the same store (e.g. two identical six-packs of beer, three identical bottles of wine, etc.). We observe a total of 216,987 purchases of alcoholic beverages. KWP does not provide the barcode of the product, but several characteristics, including the type of beverage, the alcohol content, the brand and/or producer, and the name of the retailer where the purchase was made. Information on the packaging (number of units and unit volume) can be used to calculate the total quantity purchased, taking into account bulk promotions.

As many products are purchased infrequently, we have chosen to group the products offered to consumers by defining homogeneous varieties. To do this, we reduce the range of characteristics that differentiate the products to a few key elements mapping differences in consumer preferences over quality, retailer/producer strategies and alcohol content. We start by grouping products into six categories: ciders, beers, aperitifs, spirits, still wines and sparkling wines. Each category is then subdivided according to the type of beverage (e.g. champagne vs other sparkling wines, for sparkling wines), the producer, the brand and the retailer. By crossing category, type, producer, retailer and brand, we obtain 1,662 different varieties.<sup>5</sup> For each variety and 4-week period, we calculate the quantity purchased and the expenditure at national level (adjusting them for sampling weights), and finally the average unit value of one litre (in €/litre). The annual values are then obtained by averaging the 13 four-week periods. Each period is given the same weight.

## 1.2. Structure of the Alcohol Market

Table 1 provides a breakdown of purchases by alcohol category, as well as the quartiles of unit values of these purchases and the average percentage of alcohol. Still wines are the most

popular, accounting for over 41% of purchases, well ahead of beers (23% of purchases) and spirits (17% of purchases). Spirits are also the most expensive alcoholic beverages, ahead of sparkling wines and aperitifs. The wide price range for sparkling wines is explained by the price difference between champagne and the other sparkling wines. Except for wine, the variation in median unit prices between categories is positively correlated with the median alcohol content of the categories. Unit prices for wine also show little price difference with beer, contrary to what is observed in countries that traditionally brew beer rather than make wine.

Table 2 shows the distribution of purchases across the main alcohol categories in terms of volume, in litres and in pure alcohol (standard drink).<sup>6</sup> Still and sparkling wines account for 51.3% of the volume in litres and 52.6% in pure alcohol content. The second most popular category, beer, accounts for 32.8% by volume and 13.6% by pure alcohol. These figures are 8.3% and 27.4% respectively for spirits. The rankings of the categories in terms of volume in litres and purchases are similar, but the proportions are slightly different. Beers account for 22% of purchases and 32% of volume, while aperitifs and spirits account for 25% of purchases and 15% of volume. This is explained by variations in container sizes (e.g. cartons for beer, cubitainers for wine).

Given the economic and cultural concerns regarding the still wine market, it is important to clarify its market segmentation. Table 3 shows the volume and frequency of purchases of still wine by quality.

5. See Online Appendix S2 for more details.

6. As the alcohol content is the quantity of pure alcohol (or ethanol) in millilitres (ml) contained within 100 ml and since the density of alcohol is 0.8 g/ml, the quantity of pure alcohol in grams can be calculated using the following formula:  $0.8 \times \text{alcohol content} \times \text{quantity in ml} / 100$ . For example, 100 ml of wine with an alcohol content of 12% contains 12 ml of pure alcohol, so 120 ml per litre, and therefore  $120 \times 0.8 = 96$  g of pure alcohol.

Table 1 – Distribution of purchases by alcohol category

	Purchases		UV (in €/l), quartiles			% Alcohol		
	N	%	Q(25)	Q(50)	Q(75)	Min.	Q(50)	Max.
Ciders	7,520	3.47	2.25	2.79	3.39	2.0	4.4	4.6
Beers	48,349	22.28	2.01	2.85	3.48	0.5	5.8	12.2
Aperitifs	21,112	9.73	4.23	6.25	9.10	0.0	15.0	25.0
Spirits	35,391	16.31	14.36	16.87	19.86	0.0	40.0	47.0
Still wines	90,944	41.91	2.42	3.23	4.24	11.9	12.0	13.0
Sparkling wines	13,671	6.30	6.00	8.11	22.76	0.0	12.0	12.5

Notes: Unit values (UV) obtained by dividing the total spent by the quantity purchased for each variety, adjusted for the household and purchase sampling weights provided by Kantar WorldPanel.

Source and coverage: Kantar WorldPanel 2014; non-abstinent households from the constant panel (N = 6,353).

Table 2 – Quantities purchased and share (%) by alcohol category, per household per year

	Litres	% (vol. in l)	Standard drinks	% (vol. in p.a.)
Ciders	1.69	2.29	4.87	0.71
Beers	24.17	32.77	94.05	13.63
Aperitifs	3.94	5.34	39.38	5.71
Spirits	6.15	8.33	189.00	27.39
Still wines	34.01	46.12	327.06	47.40
Sparkling wines	3.79	5.14	35.70	5.17
Total	73.75	100.00	690.06	100.00

Notes: 1 standard drink = 10 g of pure alcohol (p.a.); values adjusted for the household and purchase sampling weights provided by Kantar WorldPanel.

Source and coverage: Kantar WorldPanel 2014; non-abstinent households from the constant panel (N = 6,353).

Table 3 – Quantities purchased and share (%) of wine purchases by segment, per household per year

	Litres	Proportion of volumes	Proportion of purchases (%)
<i>Vins de table</i>	7.75	22.80	18.29
<i>Vins de pays</i>	11.10	32.63	23.16
Appellations	15.16	44.57	58.54
Price ≤ 3 €/l	16.60	48.80	34.51
3 €/l < Price ≤ 5 €/l	11.04	32.46	41.18
Price > 5 €/l	6.38	18.74	24.32
Total	34.01	100.00	100.00

Notes: Averages (share as a %); values adjusted for the household and purchase sampling weights provided by Kantar WorldPanel.

Source and coverage: Kantar WorldPanel 2014; non-abstinent households from the constant panel (N = 6,353).

In our data, the majority of still wine purchases are made in the *vins de table* (table wines) and *vins de pays* (country wines) label segments (55% of total volumes), and fall in the price range that define the low-end quality level according to market professionals (Cubertafond, 2015): more than 80% of wine volumes are purchased at less than 5 euros per litre.<sup>7</sup> The *vins de table* and *vins de pays* account for 41% of the volumes purchased and 75% of the purchases made at less than 5 euros per litre. Wines purchased at less than 3 euros per litre account for 35% of purchases and almost 50% of volume, which is explained by the fall in unit prices for wines in bag-in-box packaging, which is used largely for low-end products. These descriptive statistics highlight a fact that has been overlooked in the public debate on alcohol regulation: a significant proportion of the volume of wine placed on the market is of poor quality.<sup>8</sup>

Since the social cost of alcohol consumption depends on the total amount of pure alcohol consumed, we can finally ask about the population heterogeneity of pure alcohol consumption in quantity and price. The left-hand side of the Figure shows the distribution of purchases in terms of pure alcohol per adult in 2014.

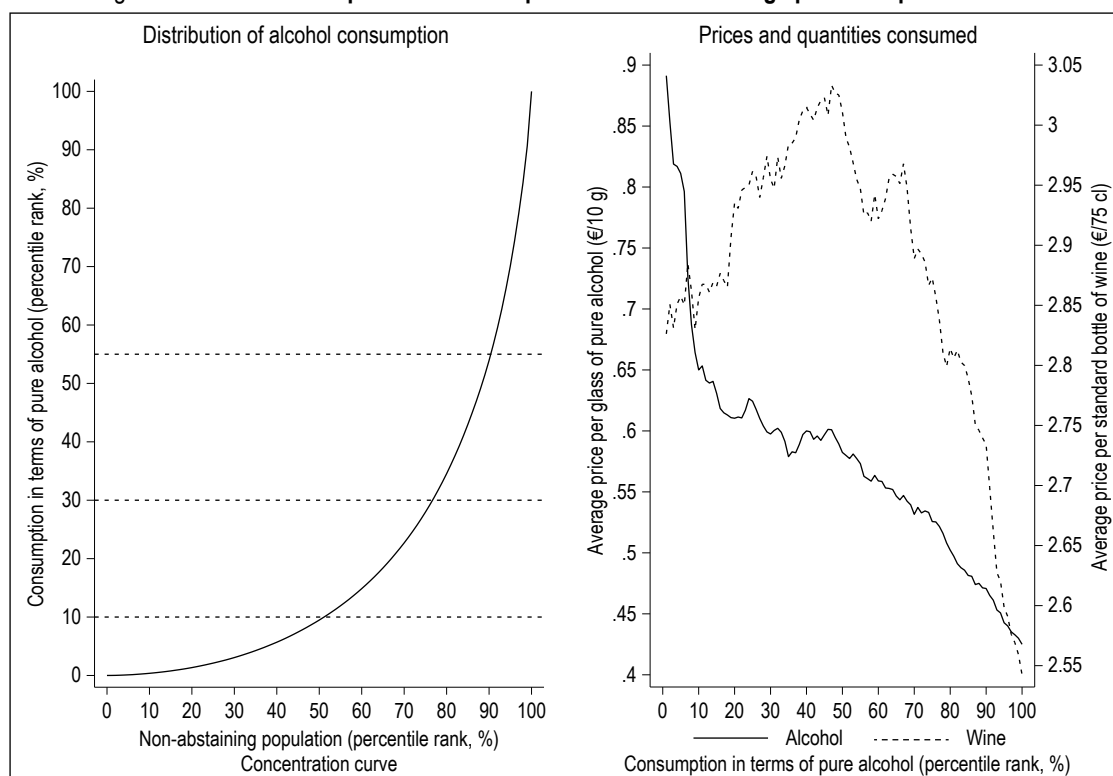
Half of the non-abstinent population consume 90% of volumes of pure alcohol, 70% of volumes are consumed by only a quarter of the same

population, and almost half (45%) consume only 10% (see the horizontal dotted lines, from bottom to top). The right-hand side of the figure shows the average price paid per standard drink (i.e. 10 g of pure alcohol, left-hand vertical axis) and for a standard bottle of wine with an alcohol content of 12% (75 cl, i.e. 72 g of pure alcohol, right-hand vertical axis) as a function of the household position in the distribution of total consumption of pure alcohol. The average price per standard drink of pure alcohol decreases with total consumption when all alcohols are considered. However, the relationship for wine is concave: the average price initially increases with quantity, reaching a maximum of over 3 €/bottle around the median point of the total consumption of pure alcohol, and then falls again to a minimum of 2.5 €/bottle.

7. Like Cubertafond (2015, pp. 71–74), we distinguish between 5 segments on the wine market: basic (less than €3/litre), popular premium (between €3 and €5/litre), premium (between €5 and €7/litre), super-premium (between €7 and €15/litre), ultra-premium and iconic (above more than €15/litre). As the super-premium and ultra-premium segments are poorly represented in our data (0.13% of volumes and 0.23% of purchases), we have grouped them together with the premium segment. The *vins de pays* and *vins de table* categories have become increasingly heterogeneous in quality over the last two decades, with many independent winemakers distancing from the constraints of the appellations in order to regain freedom of style in the production process.

8. Our data likely overestimate this market characteristic due to the aforementioned biases in terms of representativeness. We have a better coverage of purchases by lower class and retired consumers, whose income limits access to quality wines, than we do of purchases by upper class and employed consumers. However, this does not present a limitation for our study, as we are specifically interested in the potential health impacts and redistributive effects of alcohol price policy reforms.

Figure – Normal consumption in terms of pure alcohol and average purchase prices in 2014



Notes: The graph on the left shows the concentration curve of the usual consumption of households in terms of pure alcohol (in g/adult); the graph on the right shows the average unit price paid per standard glass (€/10 g of pure alcohol – solid line using the axis on the left) and the average unit price per bottle of wine (€/75 cl – dotted line using the axis on the right), according to their position in the distribution of normal consumption in terms of pure alcohol.

Source and coverage: Kantar WorldPanel 2014; non-abstinent households from the constant panel ( $N = 6,353$ ).

These curves illustrate the link between average habitual consumption and price, especially for heavy drinking households. This relationship reflects both how prices affect consumption and how heavy drinkers seek low prices. A pricing policy targeted at low-end products would have a relatively greater impact on heavy drinkers, with potentially greater health benefits. A minimum price or a volumetric excise tax, as opposed to an *ad valorem* tax, makes this targeting possible.<sup>9</sup>

## 2. Effectiveness and Regressivity of the Current Tax System

### 2.1. Excise Taxes on Alcoholic Beverages

Alcoholic beverages are subject to a number of specific and volumetric excise taxes and duties, as shown in Table 4.<sup>10</sup> Excise duties are subdivided into transportation duties, consumption duties and specific duties for beer, vary according to the product category (wine, beer, spirits, cider, etc.), their physical characteristics (still wines, sparkling wines, etc.), their alcohol content (beers with an alcohol content of less or more than 2.8%, etc.) and their production conditions (small or large brewery for beers, etc.). In addition to excise duties, consumers pay

social security contributions indexed to the pure alcohol content. Finally, the «premix» tax applies to mixtures of alcoholic and non-alcoholic beverages marketed to adolescents and young adults, in addition to other taxes. It is reduced from €11 to €3 per decilitre of pure alcohol for wine-based premixes (e.g. grapefruit wine).

Alcohol taxation, which has changed little between 2022 and 2014, has three salient features. First, the excise duty on wine does not depend on the alcohol content, in contrast to the excise taxes on other alcoholic beverages. This represents a disconnect between taxation and health issues, as the health risks of consumption depend essentially on the amount of pure alcohol in the beverage. Secondly, excise duties on wine are set at a much lower level than those on other alcoholic beverages particularly spirits. However, as the excise duty on wine is calculated on volumes in litres, while excise duties

9. Volumetric taxes are expressed in units of goods (hectolitre, for example) and are added to the unit price, while *ad valorem* taxes are proportional to the market value of the goods (VAT is an example of this). As a result, with identical tax revenue, the burden of volumetric taxes is heavier on low-end products.

10. VAT is charged on the gross price plus these taxes. It is charged at a rate of 20% for takeaway beverages and 10% for those to be consumed on premises (restaurants, cafés, bars, nightclubs).

Table 4 – Specific taxation of alcoholic beverages in 2022 and 2014

	2022	2014
Excise duties		
Transportation duties		
Still wines (€/hl)	3.92	3.72
Sparkling wines (€/hl)	9.70	9.23
Apple and pear ciders/meads (€/hl)	1.37	1.31
Specific duties		
Beers ≤ 2.8% vol. (€/hl/%)	3.85	3.66
Beers > 2.8% vol. + small brewery (€/hl/%)	3.85	3.66
Beers > 2.8% vol. + large brewery (€/hl/%)	7.70	7.33
Consumption duties		
Rum from overseas departments (€/hlpa)	903.64	859.79
Distilled spirits (€/hlpa)	903.14	859.31
Other spirits (€/hlpa)	1,806.28	1,718.61
Natural sweet wines/liqueur wines (€/hl)	48.97	46.59
Other intermediate products (€/hl)	195.86	186.36
Social security contribution (> 18% vol.)		
Spirits (excl. overseas departments) (€/hlpa)	579.96	551.82
Natural sweet wines/liqueur wines (€/hlpa)	19.60	18.64
Other intermediate products (€/hlpa)	48.97	46.59
Beers, small brewery (2022 = €/hl, 2014 = €/hl/%)	19.60	1.47
Beers, large brewery (2022 = €/hl, 2014 = €/hl/%)	48.97	2.93

Notes: hl = hectolitre, hlpa = hectolitre of pure alcohol; small brewery = production ≤ 200,000 hl/year; for more details regarding 2022, see <https://www.douane.gouv.fr/fiche/droits-des-alcools-et-boissons-alcooliques>.

The page <https://entreprendre.service-public.fr/vosdroits/F32101?lang=en> provides a list of the majority of the reference texts addressing the taxation of alcoholic beverages to date. The "other intermediate products" category includes alcohols with an alcohol content of less than 22% that are neither beers nor wines, for example Vermouths and Gentiane liqueurs.

Source: The 2014 data are taken from the Order of 29 December 2013 setting the 2014 excise duty tariff for the alcoholic beverages set out in Articles 317, 402 bis, 403, 438 and 520 A of the French General Tax Code, the tariff for the contributions set out in Articles 1613 ter and 1613 quater of the French General Tax Code, as well as the tariff for the contribution set out in Article L. 245-9 of the French Social Security Code.

on other beverages are calculated in volumes of pure alcohol, the comparison is difficult. Finally, taxation is «riddled» with exemptions which, in addition to those for wine, also apply to traditional spirits (rum from the French overseas departments, liqueur wines) and beers produced by small breweries. We will not discuss the economic and cultural reasons for these exemptions here (lobbying by the industry, protecting small producers, historical legacy, barriers to international trade, etc.).<sup>11</sup> These three factors therefore justify examining the possibility of reviewing the specific taxation of alcohol in order to bring it in line, at least partially, with public health objectives.

## 2.2. A Taxation System That Is “Distortionary” With Respect to Public Health

Three public policy objectives can be assigned to the taxation of alcoholic beverages: raising revenue for the State, in particular to cover the social costs of alcohol abuse; protecting public health; and creating price barriers to protect domestic production. With regard to the first two objectives, taxation can be considered effective if the tax burden on pure alcohol is the same for all products.

Kantar WorldPanel data provides information on the alcohol content of products and therefore the level of taxation they are subject to. Using the information in Table 4, we can calculate the tax burden on each purchase, which, when subtracted from the average unit price, gives us a gross price. This allows us to precisely define the differences in the tax burden of the different varieties and categories of beverages.

The upper part of Table 5 provides an estimate, based on our data, of the tax revenue associated with the various taxes, both overall and by alcohol category. Out of 9.5 billion euros of household expenditure (or sales for home consumption), 1.9 billion euros is accounted for by indirect taxes (excluding VAT): 77.3% from spirits, 12.8% from beer, 7.4% from aperitifs, 2.4% from still and sparkling wines. The apparent tax burden, i.e. the share of taxes (duties and VAT) in household expenditure, on alcoholic beverages, is on average 36%, with large differences between groups: 17% for cider and wine (still and sparkling), 33% for beer, 38% for aperitifs, 68% for spirits. There is therefore a

11. On the role of barriers to international trade, see for example Arnaud et al (2002).



discrepancy between the distribution of purchase volumes and the distribution of the tax burden. Wines (still and sparkling) account for 51.3% of purchases and 23.0% of tax revenue, while spirits account for 8.3% of purchases and 55.7% of tax revenues.

The lower part of Table 5 shows the share of taxes in the average purchase price of the different categories, expressed in euro per litre and in euro per standard drink (10 g of pure alcohol). Whatever the unit of measurement, excise taxes account for more than half (62%) of the pre-VAT price of spirits, compared with around 1% for ciders, still wines and sparkling wines, and between 20% and 27% for beer and aperitifs. The price (including VAT) of a standard drink of pure alcohol is much lower for still wines (€0.36). It is very similar for beers, aperitifs and spirits (around €0.54).

These findings confirm the conclusions of a Senate information report:<sup>12</sup> the taxes currently levied in France favour neither a tax revenue objective nor public health considerations. If their objective were to maximise tax revenues, they would be applied primarily to the most heavily consumed beverages (or those generating the most revenues). However, wine accounts for more than half of the alcohol purchased in terms of quantity, but only contributes 2.4% of total indirect taxes. If the objective were to minimise health risks, the taxes would be linked to the

alcohol content. Yet, (still and sparkling) wines are less heavily taxed in terms of their alcohol content and in comparison with beers.

### 2.3. Regressivity and Fairness of the Current Taxation System

Current taxation particularly favours wines over spirits. In order to understand the potential redistributive impacts of alcohol price policy reforms, it is therefore important to consider how the share of the different alcohol categories in purchases change with household living standard. To do this, we classify households into four classes of living standards – low-income (15.7%), lower middle income (30.6%), upper middle income (41.3%) and high-income (12.3%) – provided by Kantar WorldPanel.<sup>13</sup> The analysis of consumption patterns shows that high-income households tend to consume relatively more wine and less beer and spirits at home than low-income households

12. Fiscalité et santé publique : état des lieux des taxes comportementales (*Taxation and public health: overview of behavioural taxes*), Senate Report, 2014, <https://www.senat.fr/notice-rapport/2013/r13-399-notice.html>. For information regarding the disconnect between taxation and health issues, see the recent contributions by Spach (2016) or Mété (2017), as well as Nourrisson (1990) for a historical study.

13. Kantar calculates household standards of living (adult equivalent income) from the household composition and the self-declared monthly income. See Table S1-2 in Online Appendix S1 for the definition. The partition into four classes is designed to capture the segmentation of the FMCG market according to standard of living (e.g. choice of brands, retailer, etc.). It should be noted, however, that the methodology used for this segmentation is not documented by Kantar WorldPanel. The results in this section are robust to the use of an alternative measure of gross disposable income constructed from self-declared income and the distribution of tax incomes provided by the Institut des politiques publiques (IPP).

Table 5 – Tax revenue and price breakdown (€/l and €/10 g of pure alcohol) by alcoholic beverage category

	Ciders	Beers	Aperitifs	Spirits	Still wines	Sparkling wines	Total
<i>Tax revenue</i>							
Quantity (in million l)	48.27	689.31	112.42	175.31	969.94	108.05	2,103.29
Revenue (in million €)	115.64	1,433.75	628.52	2,825.70	3,382.25	1,151.55	9,537.40
Tax revenue excluding VAT (duties)	0.63	244.11	141.27	1,471.81	36.08	9.72	1,903.63
VAT revenue	19.28	236.33	101.24	469.26	563.71	191.25	1,581.07
Total tax revenue	19.91	480.44	242.51	1,941.07	599.79	200.97	3,484.69
Apparent tax burden (%)	17.21	33.51	38.58	68.69	17.73	17.45	36.54
<i>Breakdown of price</i>							
Price incl. tax (€/l)	2.40	2.08	5.59	16.12	3.49	10.66	
Price incl. tax (€/10 g)	0.83	0.53	0.56	0.52	0.36	1.13	
VAT (%)	16.67	16.48	16.11	16.61	16.67	16.61	
Price excl. VAT (€/l)	2.00	1.74	4.69	13.44	2.91	8.89	
Price excl. VAT (€/10 g)	0.69	0.45	0.47	0.44	0.30	0.94	
Taxes excl. VAT (€/10 g)	0.005	0.09	0.13	0.27	0.004	0.009	
Taxes excl. VAT (%)	0.66	20.39	26.79	62.46	1.28	1.01	
Gross price (€/l)	1.98	1.39	3.67	5.00	2.87	8.80	
Gross price (€/10 g)	0.69	0.36	0.37	0.16	0.30	0.93	

Notes: Quantities adjusted for the household and purchase sampling weights provided by Kantar WorldPanel, and scaled up to the French population; apparent tax burden = 100 x tax revenue/revenue; prices adjusted for purchase quantities and for household and purchase sampling weights provided by Kantar WorldPanel; VAT expressed as a percentage of the price including tax, and taxes excluding VAT expressed as a percentage of the price excluding VAT.

Source and coverage: Kantar WorldPanel 2014; non-abstinent households from the constant panel (N = 6,353)

(see Table S3-1 in Online Appendix S3). As a result, the current tax system is expected to be regressive, i.e., low-income households pay a relatively larger proportion of their income in specific taxes on alcohol.

The regressivity of current taxation is revealed by the differences in household tax effort rates, defined as the ratio of taxes paid to disposable income (see Ruiz & Trannoy, 2008, and Online Appendix S3). Table 6 compares the average tax effort rates of low-income and high-income households, without and with the inclusion of VAT, and without and with adjustment for the socio-demographic characteristics of the households and their habitual consumption of pure alcohol.<sup>14</sup>

The average tax effort rate is 0.26 per cent excluding VAT and 0.48 per cent when VAT is included. These statistics are robust to adjustment for differences in socio-demographic characteristics between households. Moreover, tax effort is higher for low-income households, at around 0.45% excluding VAT, compared to 0.11% for high-income households. By way of comparison, the tax effort rates calculated by Ruiz & Trannoy (2008) from the 2001 Household budget survey were 0.40-0.47% for the first three deciles of living standards, compared with 0.16-0.26% for the top three deciles. Our statistics therefore suggest that the regressivity of alcohol taxation has increased between 2001 and 2014. Table 6 also shows the implicit tax rate for each household class, i.e., the ratio of the tax burden to pre-tax expenditure. The implicit tax rate, adjusted for socio-demographic differences, is 65.27% for low-income households compared to 53.71% for high-income households, which raises the question of horizontal equity, since a euro spent on alcohol is not taxed in the same way depending on the household's standard of living.

The regressivity of taxes can be mechanically explained by differences in income (in the denominator of the effort rate), but also by a higher tax burden borne by low-income households (in the numerator). Low-income households have a higher tax burden in absolute terms (+18.65 €/year before adjustment). In additional analyses presented in Online Appendix S3, we decompose the tax burden differential between low-income and high-income households into the sum of several effects: (1) a quantity effect due to differences in the quantities purchased in each of the six alcohol categories; (2) a quality effect corresponding to differences in the quality of products within a category as reflected in the pre-tax prices; (3) an effect reflecting differences in the implicit tax rates applied to the category of products purchased; and (4) a residual effect produced by the correlations between pre-tax prices and quantities, and taxes and pre-tax expenditure. The difference in the tax burden is largely explained by the quantity effect, as low-income households consume larger quantities of spirits, which are more heavily taxed.

However, the differential becomes negative (−10.28 €/year) if we adjust for the socio-demographic characteristics of the households and, in particular, for their average habitual consumption of pure alcohol (in standard drinks per capita per day). This can be explained by an attenuation of the differences in consumption structure between income classes after these adjustments (see Table S3-4 in the Online Appendix S3). The tax burden borne by low-income households is therefore lower than that borne by high-income households, mainly due

14. We adjusted for the following variables: habitual consumption level (less than one standard drink/adult/day, between one and two drinks, two or more drinks), age and age squared of the reference person, region (ZEAT) and type of place of residence (size of urban unit), household structure (single vs couple, with or without children).

Table 6 – Tax effort and implicit tax rate by household category (%)

	Total	Class		No. of standard drinks per cap. per day		
		High-income	Low-income	≤ 1	[1; 2]	>2
Tax effort, excl. VAT						
Not adjusted	0.26	0.45	0.11	0.08	0.31	0.93
Adjusted	0.26	0.46	0.11	0.08	0.30	0.92
Tax effort, incl. VAT						
Not adjusted	0.48	0.77	0.22	0.16	0.58	1.62
Adjusted	0.48	0.78	0.21	0.17	0.57	1.59
Implicit tax rate						
Not adjusted	59.61	67.77	51.31	55.52	63.05	72.36
Adjusted	59.61	65.27	53.76	55.58	62.67	72.48

Notes: Values adjusted by the sampling weights; rates are calculated in relation to the household's self-declared income provided by KWP. Source and coverage: Kantar WorldPanel 2014; non-abstinent households from the constant panel (N = 6,353).

to a quality effect: they buy cheaper products within each alcohol category. A comparison of the adjusted and unadjusted results therefore shows that the tax difference between high- and low-income households can be explained by the combination of a tax system that favours wines over spirits and social differences in the total quantities of pure alcohol habitually consumed, leading to differences in the structure of alcohol purchases.

Finally, the regressivity in effort rates is explained on the one hand by inequalities in taxpaying capacity and a tax system biased in favour of wine and on the other hand by the combination of socio-economic inequalities in alcohol risks as measured by the average habitual consumption of pure alcohol. So, can we conclude from the current regressivity of alcohol taxation that it is unfair? Asking this question is tantamount to questioning and documenting the role of socio-economic determinants in the total amount of pure alcohol that is purchased by households.<sup>15</sup> Beyond this question of vertical equity, it can at least be said that, from a public health perspective, current taxation poses a problem of horizontal equity, since the taxes paid per gram of pure alcohol vary greatly depending on the category of beverage.

### 3. Potential of Pricing Policies

A reform of the alcohol price regulation policy can use two instruments: (1) a revision of the specific taxation of alcohol; (2) the introduction of a minimum retail price per unit of pure alcohol. In the case of a tax reform, we have considered replacing all current excise duties and taxes with a single excise tax. This policy option, like the minimum unit price, is in line with international recommendations (e.g. World Health Organisation – WHO) and the public health literature. Volumetric excise taxes have a greater impact on the lower end of the price distribution than taxes on the value of products: since at-risk or dependent consumers tend to buy low-end products, taxing the latter could *a priori* be a means of better targeting the at-risk population.

#### 3.1. Definition of Scenarios

Apart from the case of the minimum unit price considered in isolation, i.e. without any new tax, all the scenarios consider the introduction of a tax that replace current taxes (excise duties and social security contributions, excluding VAT). Formally, let  $p_1 = p_0 + \tau$  with  $p_1$  the simulated unit price (per litre) (excluding VAT),  $p_0$  the

gross unit price and  $\tau$  the unit tax, the latter being defined as  $\tau = t \times d$ , where  $d$  is the degree of alcohol and  $t$  is the unit tax per degree of alcohol. In the case of a flat tax,  $t$  is the same for all drinks, regardless of their alcohol content (let's note  $t = x$ ), and the unit tax  $\tau$  increases with the alcohol content.

In the case of a progressive tax,  $t$  increases with the alcohol degree of the product. Let us consider the following 6 intervals of alcohol content:  $[0; 5[$ ,  $[5; 10[$ ,  $[10; 15[$ ,  $[15; 25[$ ,  $[25; 45[$  and  $[45; 100]$ . The value of  $t$  is different for each interval. We have assumed that it is twice as high in the second interval as in the first, three times as high in the third, etc., and marginally increasing. With progressive taxation, the tax  $t$  varies for each degree of alcohol in a drink: a wine with  $d = 13\%$  will have a tax  $t = x$  on the first 5 degrees, a tax  $t = 2 \times x$  on the next 5, and another  $t = 3 \times x$  on the last 3, giving a total of  $\tau = (1 \times 5 + 2 \times 5 + 3 \times 3) \times x = (3 \times d - 15) \times x$  euros per litre. Table S4-1 in Online Appendix S4 summarises these elements.

For each of these two taxes, flat and progressive, we calibrate two values of  $x$ , a low value and a high value, based on the assumption consumer and produce behaviour do not change. The low value is calibrated so that total tax revenue is unchanged from the existing situation, to achieve tax neutrality.<sup>16</sup> The high value is calibrated on the hypothesis that the reform should generate non-VAT tax revenues that *a priori* cover the public finance expenditure generated by alcohol. For the latter, we have used the figures provided by Kopp (2015) and applied a coefficient of 58% corresponding to the share of home consumption in total consumption.<sup>17</sup> The second objective is therefore neutrality for public finances. After calibration, the four scenarios under assessment (S1–S4) are described in Table 7.

Finally, with regard to the minimum unit price, we considered firstly that the current taxation remains unchanged (scenario S5), and then that it is replaced by a progressive tax similar to S3

15. A recent literature in health economics proposes breaking down inequalities in health status into one part related to circumstances (income, parental health behaviour, etc.) and another part related to efforts (e.g. smoking), see Jusot et al. (2013). To our knowledge, such a decomposition exercise has never been carried out for inequalities in health behaviours.

16. The tax revenue is calculated as shown in Table 5, using the household sampling weights to extrapolate to the national population.

17. We would like to thank Chantal Julia and Mathilde Touvier from the Nutritional Epidemiology Research Team at Paris 13 University for estimating these figures based on the 2014 consumption data of the NutriNet-Santé study cohort (24h dietary records). It can be noted that the total revenue for specific taxes on alcohol was assessed at 3.2 billion euros in 2011. Based on our data, we calculate the specific tax revenue from home consumption at 1.9 billion euros (cf. Table 5), a ratio of 59.5%, which is in line with the NutriNet data.

Table 7 – Scenarios

	Flat tax	Progressive tax
Low rate (tax neutrality)	S1: $x = 7.24$ euro cents	S3: $x = 3.68$ euro cents
High rate (neutrality for public finances)	S2: $x = 14.57$ euro cents	S4: $x = 6.74$ euro cents

(scenario S6=S3+S5). The minimum price is set at 50 euro cents per standard unit (10 g), which is slightly lower than the price introduced in Scotland (50 pence).<sup>18</sup>

### 3.2. Expected Impacts With no Reaction from Economic Agents

Taking a purely accounting perspective, we can simulate the likely impact of these scenarios on prices and tax revenues by assuming that (i) producers and retailers adjust their prices to fully reflect the effects of the reform on consumer prices and (ii) consumption choices within and between categories remain unchanged.

Table 8 shows that the average price of wines (still and sparkling) would increase from 0.8 to 2 euros per litre depending on the scenario, while the average price of spirits would fall from 3 to 0.7 euros per litre in the first three scenarios (S1–S3) and rise from 0.3 to 1.3 euros per litre in the three remaining scenarios (S4–S6). In addition to wines, the flat tax is also unfavourable to cider and beer. This is not the case with progressive taxes, which favour beer, penalise wines to a lesser extent and are less favourable to spirits.

Table 9 replicates this analysis by examining the impact on the price of a standard drink by alcohol category. As expected, the different tax reforms tend to significantly increase the price of a standard drink of wine and to reduce the price differential between categories. Only a high progressive tax (S4) or the introduction of a minimum price (S5) would prevent the price of spirits and aperitifs from falling. In all cases,

the relative price of wine would rise sharply, suggesting substitution to other alcohols that become relatively cheaper. Only by modelling the substitution behaviour of households can we make accurate predictions about the extent of these substitutions and their impact on pure alcohol consumption.

The simulated total tax revenue is about the same for the scenarios based on the objective of tax neutrality beyond approximation and rounding errors, the revenue does not vary. On the other hand, Table S4-2 in Online Appendix S4 shows that the breakdown of revenue between alcohol groups varies considerably. The contribution of wine rises sharply, offsetting the fall in the contribution of spirits and increasing total revenue in the minimum price scenarios S5 and S6. The adoption of high rates (S2 and S4) further increases the impact on tax revenue from wine, while reducing the impact on tax revenue from spirits. As the quantities are fixed, these variations only reflect differences in the tax burden between the alcohol categories.

Table S4-3 in Online Appendix S4 gives a more detailed breakdown of the expected impact on the wine industry. The impact of the different scenarios decreases sharply with quality, measured by label or unit price: for example, the flat tax would imply an average price increase of almost 45% for the less expensive wines, compared to

18. We calculate the price per gram of pure alcohol for each beverage by dividing its unit price (including taxes, but excluding VAT),  $p_i$ , by its content in terms of grams of pure alcohol. We replace this with the minimum price if it is lower. This is the case for 521 varieties: 116 beers, 78 aperitifs, 117 spirits, 182 still wines and 28 sparkling wines. We then recalculate  $p_i$ .

Table 8 – Average unit prices before and after reform in €/l (relative change in %)

	Current taxation	Uniform tax		Progressive tax		Minimum price	
		Low rate (S1)	High rate (S2)	Low rate (S3)	High rate (S4)	Current duties (S5)	Progressive tax (S6)
Ciders	2.40	2.69 (+12.1)	3.01 (+25.4)	2.54 (+5.8)	2.67 (+11.2)	2.40 (0.0)	2.54 (+5.8)
Beers	2.08	2.08 (0.0)	2.51 (+20.7)	1.90 (-8.7)	2.10 (+1.0)	2.26 (+8.7)	2.19 (+5.3)
Aperitifs	5.59	5.45 (-2.5)	6.55 (+17.2)	5.46 (-2.3)	6.37 (+14.0)	6.13 (+9.7)	6.05 (+8.2)
Spirits	16.12	9.33 (-42.1)	12.71 (-21.2)	12.15 (-24.6)	17.27 (+7.1)	17.38 (+7.8)	16.40 (+1.7)
Still wines	3.49	4.49 (+28.7)	5.54 (+58.7)	4.37 (+25.2)	5.15 (+47.6)	4.95 (+41.8)	5.23 (+49.9)
Sparkling wines	10.66	11.57 (+8.5)	12.61 (+18.3)	11.46 (+7.5)	12.21 (+14.5)	10.91 (+2.3)	11.53 (+8.2)

Notes: Prices adjusted for purchase quantities and for the household and purchase sampling weights provided by Kantar WorldPanel. Source and coverage: Kantar WorldPanel 2014; non-abstinent households from the constant panel ( $N = 6,353$ ).

Table 9 – Average unit prices before and after reform in €/standard drink (relative change in %)

	Current taxation	Uniform tax		Progressive tax		Minimum price	
		Low rate (S1)	High rate (S2)	Low rate (S3)	High rate (S4)	Current duties (S5)	Progressive tax (S6)
Ciders	0.83	0.94 (+13.3)	1.05 (+26.5)	0.88 (+6.0)	0.93 (+12.0)	0.83 (0.0)	0.88 (+6.0)
Beers	0.53	0.54 (+1.9)	0.65 (+22.6)	0.49 (-7.5)	0.54 (+1.9)	0.58 (+9.4)	0.56 (+5.7)
Aperitifs	0.56	0.55 (-1.8)	0.66 (+17.9)	0.55 (-1.8)	0.64 (+14.3)	0.61 (+8.9)	0.61 (+8.9)
Spirits	0.52	0.30 (-42.3)	0.41 (-21.2)	0.40 (-23.1)	0.56 (+7.7)	0.57 (+9.6)	0.53 (+1.9)
Still wines	0.36	0.47 (+30.6)	0.57 (+58.3)	0.45 (+25.0)	0.54 (+50.0)	0.52 (+44.4)	0.54 (+50.0)
Sparkling wines	1.13	1.23 (+8.8)	1.34 (+18.6)	1.22 (+8.0)	1.30 (+15.0)	1.16 (+2.7)	1.22 (+8.0)

Notes: Prices adjusted for purchase quantities and for the household and purchase sampling weights provided by Kantar WorldPanel. Source and coverage: Kantar WorldPanel 2014; non-abstinent households from the constant panel ( $N = 6,353$ ).

less than 18% for the more expensive wines.<sup>19</sup> The minimum price, on the other hand, would only affect wines priced below €3.20 per litre.

Lastly, when we compare the expected redistributive impacts, detailed in Table S4-4 in Online Appendix S4, the implicit tax rate increases sharply in scenarios S2 and S4 and only slightly in scenarios S1 and S3. These impacts are similar regardless of the income and normal consumption levels of households, which suggests that the proposed tax reforms would have little redistributive effect. Conversely, in the minimum price scenario, the implicit tax rate decreases slightly, as taxation remains unchanged while the price of low-end products increases sharply.

\* \*  
\*

An analysis of the current taxation of alcoholic beverages in France shows, on the one hand, that it is insufficient to cover the public expenditure associated with their consumption and, on the other hand, that it is geared more towards protecting (a large part of) domestic production than towards public health objectives. There are significant distortions between product categories, mainly in favour of wines, and in particular low-end wines produced by large industrial groups, which are the most consumed and least taxed category given their alcohol content. The economic and cultural importance of wines is not specific to France: most wine-producing countries in Europe have tax rates close to zero for this category of alcoholic beverages; this is not the case for countries that do not produce wine.<sup>20</sup>

However, a revision of alcohol taxation could bring it into line with public health objectives. We have therefore simulated the potential impact

on prices of several reform scenarios consisting of replacing the specific taxes on alcohol with a single excise tax proportional to the alcohol content – either flat or progressive (more penalising for stronger alcohols) – or introducing (separately or in combination) a minimum price per gram of pure alcohol contained in the product. These two options are the subject of a relative consensus within the scientific community (public health/epidemiology and economics). They are primarily aimed at the high-risk population of heavy drinkers: a quarter of alcohol drinkers consume almost three quarters of the quantities that are purchased, and often opt for poorer quality products (less than 50 cents for a standard drink).

For the most part, our results highlight the superiority of a minimum pricing policy over the other scenarios. Such a policy would allow an increase in the price of low-end alcoholic beverages, i.e. those priced below 3.20 euros per litre and most likely to be consumed by heavy drinkers. Wines would be particularly hard hit, with an average price increase of more than 40%, but this would be almost exclusively at the low end of the market (those costing less than 3 euros per litre), where wine prices would double.

Compared to other alcohol sectors, particularly the spirits sector, the wine sector includes many small producers (e.g. small cooperatives, independent winemakers). In our data, which probably under-represents small producers due to the over-representation of mass retail

19. In the first four scenarios, the impact on prices is more or less the same, regardless of the unit value (around +1.00, +2.06, +0.89 and +1.66 euros per litre, respectively).

20. For information regarding the organisation of the sector and its economic weight, see Cubertafond (2015) and Palle (2013), as well as the various data provided by France Agrimer. The wine trade employs more than 500,000 people directly or indirectly and boasts 85,000 vineyards and export revenue of 13 billion euros.

purchases, large companies and retailers account for only 50% of still wine purchases (and 45% of the market value), compared with 75% for sparkling wine purchases and 90% for spirits and beer purchases. The acceptability of an alcohol tax reform will therefore depend crucially on its potential impact on the wine sector.

A flat or progressive tax would affect all operators in the wine sector in a fairly similar way. The introduction of a minimum price would have the advantage of affecting only large companies and large retailers (the majority of which produce lower-priced wines, which would be subject to significant price increases), while the profits of other operators would increase significantly, despite a reduction in the quantities purchased in this market. Conversely, if a progressive tax were added to the minimum price (instead of the current excises), these operators would again be affected: the additional margin automatically generated by the introduction of the minimum price would then be cancelled out by the tax.

Our analyses of the potential impact of price reform assume that there is no significant reaction by economic agents. The *health* effectiveness of a price regulation measure will depend in particular on two key factors that we have not taken into account: (i) the impact of the policy on prices, which is not simply a matter of accounting, but also depends on the reactions of consumers, producers and retailers, based on the willingness of consumers to substitute products (or abstain from consumption), the product portfolio of each company, the nature of the contracts between producers and retailers, and the competitive structure of the market; (ii) the variation in pure alcohol consumption resulting from price variations.

*Ex-post* evaluations of tax reforms show that taxes are largely passed through onto consumer prices, which reflect the behavioural responses of economic agents. These evaluations also provide evidence that points to two important conclusions. First, the pass-through of excise taxes to consumer prices is generally higher than the pass-through of *ad valorem* taxes (Carbonnier, 2013; Shrestha & Markowitz, 2016; Ardalan & Kessing, 2021). Second, there is some heterogeneity in the pass-through rate of taxes, depending on the positioning of products in terms of quality on the one hand, and on market characteristics (consumer segments, competitive structure; cf. Shang *et al.*, 2020; Hindriks & Serse, 2019) on the other. In particular, a number of increases

(excise duties as well as *ad valorem* taxes) were undertransmitted to the prices of low-quality products and overtransmitted to the prices of higher-quality products, although pass-through rates remained close to 100% (Ally *et al.*, 2014; Wilson *et al.*, 2021). This under-transmission may slightly weaken the effectiveness of tax reforms, as at-risk groups may prefer to buy cheaper alcohol.

What could be the eventual impact on the consumption of pure alcohol? A pricing policy would lead to quality and quantity substitutions in consumer purchases. Such substitutions could reduce the expected impact of the policy by changing the structure of consumption, for example by encouraging the consumption of spirits over wine. Our approach needs to be complemented by modelling and econometric identification of the likely responses of agents to obtain more accurate predictions of the likely impact on alcoholic beverage markets and public health. In this article, we have identified the scenario that offers the best potential for a public health-oriented alcohol pricing policy. The introduction of a minimum price for a standard drink of pure alcohol has the advantage of raising average prices across all categories of alcoholic beverages, thereby limiting the opportunities for undesirable substitution between different categories of alcoholic beverages.

It would also be interesting to complement this work with an analysis of potential substitution towards cross-border shopping (for border residents) and away-from-home drinking, which is very poorly documented for France due to a lack of data. Studies from Scandinavian countries have shown that cross-border shopping is a significant margin of adjustment for border households in the presence of strict purchase regulations (Asplund *et al.*, 2007; Beatty *et al.*, 2009). Out-of-home consumption is more likely to involve young households and young adults. It is often characterized by binge drinking that differ from the usual pattern of consumption observed in adults. While price increases are effective in reducing even high levels of chronic consumption, they are less effective in reducing episodes of binge drinking (Nelson, 2015; Xuan *et al.*, 2016; Sharma *et al.*, 2016; Byrnes *et al.*, 2016; Shrestha, 2015; Pryce *et al.*, 2019). They need to be complemented by more specific measures, such as regulating the availability of the product (sales hours in bars, night sales in grocery stores, banning happy hours, etc.). □

**Link to the Online Appendix:**

[www.insee.fr/en/statistiques/fichier/7761832/ES541\\_Lecocq-et-al\\_OnlineAppendix.pdf](http://www.insee.fr/en/statistiques/fichier/7761832/ES541_Lecocq-et-al_OnlineAppendix.pdf)

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