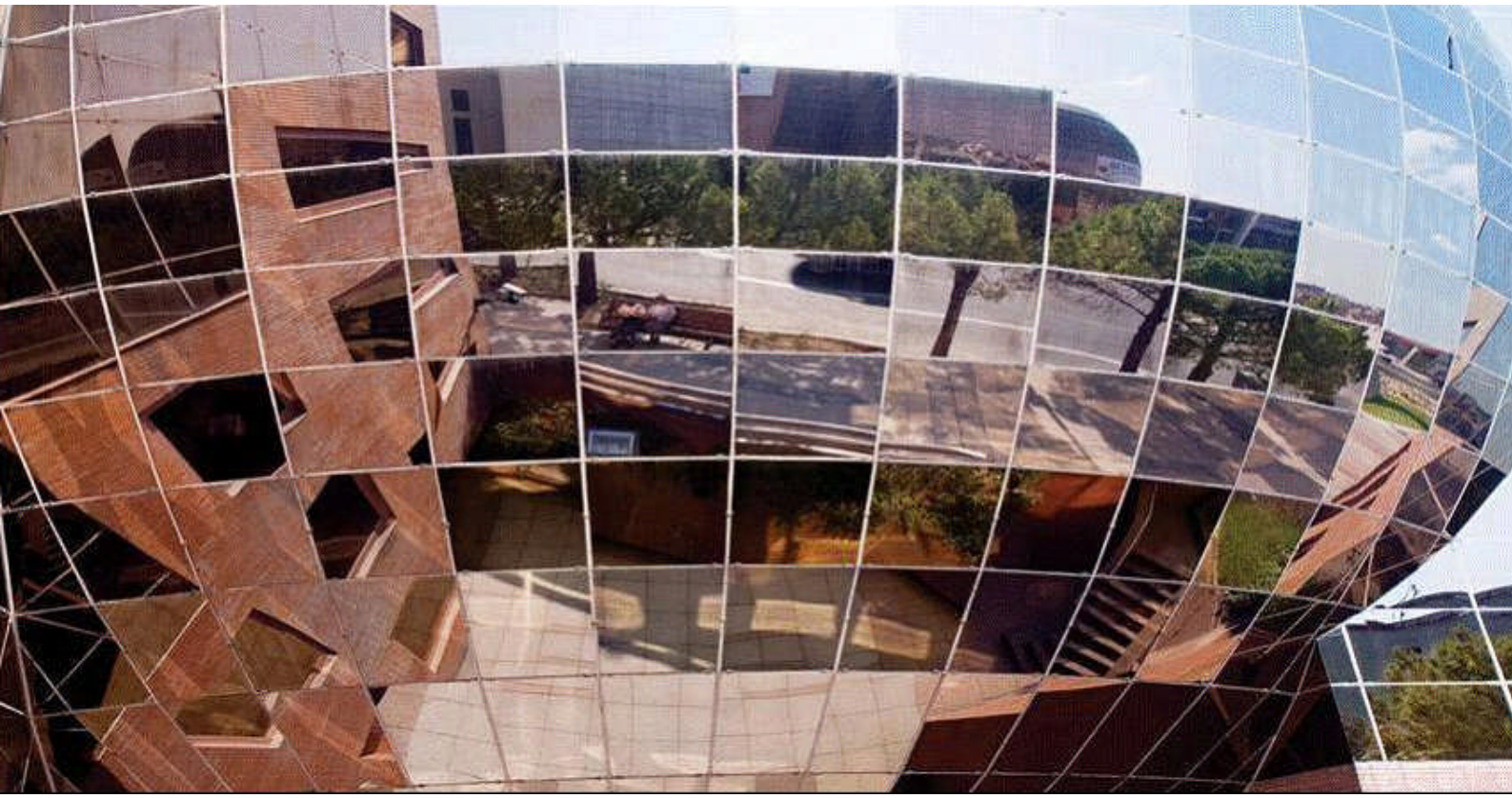
Taxing the brewing sector: a European analysis of the costs of producing beer and the impact of excise duties *

A Report for The Brewers of Europe

September 2010



*connectedthinking

PRICEWATERHOUSECOOPERS

Foreword

PricewaterhouseCoopers was created in 1998 by the merger of two firms – Pricewaterhouse and Coopers & Lybrand - each with historical roots going back some 150 years. Drawing on the talents of more than 139,000 people in 148 countries, PricewaterhouseCoopers provides a full range of advisory, financial, human resources and training, and strategy & security services to leading global, national and local companies and to public institutions, including national governments and international institutions.

The Brewers of Europe, founded in 1958 and based in Brussels, is the voice of the European brewing sector to the European institutions and international organizations. Current members are the national brewers' associations from EU Member States, plus Norway, Switzerland and Turkey.

This report has been prepared solely for The Brewers of Europe. The report sets out the work undertaken by PwC into the impact of excise taxation on the brewing sector at national level and European level, and on the comparable cost analysis of the alcoholic beverages sector at European level. As part of this study we obtained relevant information regarding direct and indirect employment generated by the relevant sectors and have been asked by The Brewers of Europe to include comments on this area within our report.

The study has been prepared in accordance with our letter of engagement dated May 25, 2009 and attached terms and conditions. The main work has been undertaken until October 2009 with further developments afterwards. PwC accepts no liability or responsibility of any kind from any third party in connection with the use or misuse of the contents of this report without the previous authorization of PwC.

Executive Summary

PricewaterhouseCoopers Asesores de Negocios, S.L. (PricewaterhouseCoopers or PwC) has undertaken an analysis for The Brewers of Europe into the impact of changes in excise taxes across the European Union (EU). The analysis considers the impact on consumption, Government revenues, profitability in the brewing sector and direct and indirect employment and is laid out in Chapter I of this report.

PwC were also commissioned by The Brewers of Europe to study the comparable costs in the route to market for the different categories of alcoholic beverages across the European Union. The focus of that part of the report - Chapter II - has been on the main drinks categories, being beer, wine and spirits.

The basis for taxation of alcoholic beverages in the European Union is contained in a number of Directives, which establish a framework that determines the methodology for taxing the different drinks categories and the minimum rates of taxation to be applied. However, the framework leaves to individual Member States setting the level of rates of excise duties, which can be applied differently to the different alcoholic drinks categories. As part of this study, PwC has additionally considered the impact of the differing rates of excise taxation of each drink category in the cost to market for that product.

During the course of this study it was necessary for PwC to investigate the cost of wages and other salary related costs. From this work PwC obtained information regarding direct and indirect employment generated by the overall alcoholic beverage sector. We have also included employment findings in this report.

The conclusions and key findings of the study come from a detailed analysis of publicly available data for seven representative countries, representing each one a cluster of countries, and selected following a number of parameters.

The main results from our analysis are the following:

Chapter I – Impact of tax changes

- **First.** We have found evidence of different impact of excise tax rises in the on-trade (bars, restaurants, etc.) and off-trade (supermarkets, hypermarkets, etc.) distribution channels. In particular, excise tax rises are in general more than passed-through into on-trade prices. This means that prices are increased by more than the amount of the tax rise. In the off-trade channel, retail prices are increased either by the same amount of the tax rise or by less of this amount.

- **Second.** There is evidence that increases in excise tax revenue (resulting from rises in the excise tax rate) are, at least in the short term, more than offset by decreases in the revenues obtained by the Government from personal and corporate income taxes, social security payments and, in some cases, also from value added tax (VAT). Our calculations show that a rise of 20% in excise taxes in the countries considered in the study would lead in aggregate to a fall in Government revenues of over EURO 115 million. Even excluding additional social security costs from subsequent job losses, this 20% rise would only lead to an increase in overall government revenues from beer sales of less than 1%.

- **Third.** Any significant rise in the excise tax rate invariably leads to a reduction in employment across the beer supply chain. According to our estimates, an increase by 20% in beer excise taxes would lead to over 70,000 jobs losses, the majority in the on-trade distribution channel.

- **Fourth.** There are significant differences between the markets analyzed in this study. The own price elasticity for beer varies considerably by country and by trade channel (on-trade and off-trade), as does the rate of pass-through of tax increases into final retail prices. This highlights the importance of considering the impact of excise duty rates, and any subsequent changes to these, at individual Member State level, and taking into account the local characteristics of the

market and the impact on the different stakeholders (Government, consumers, industry and employees).

Chapter II – Comparable cost analysis

- **Fifth.** The alcohol beverage sector generates approximately 4.7m jobs, most of them indirect jobs in the on-trade. Of the 4.4m indirect jobs generated by the alcoholic beverages sector, approximately half (2.25m jobs) were employed in the on-trade mainly in bars, clubs, restaurants and hotels and 80% of which were generated by the beer sector.

- **Sixth.** Beer is the most expensive form of alcohol to produce: €45.2 per litre of pure alcohol. The cost of producing a litre of spirits (in terms of finished product) was 3.5 times higher in 2007 than for a litre of wine or beer. However when converted to pure alcohol, wine is the cheapest form of alcohol to produce €17.9, similar to spirits (€18.6), and two and a half times less the cost of producing a litre of pure alcohol in beer €45.2.

- **Seventh.** Adding excise taxes, beer is still the most expensive form of alcohol to produce and deliver to the consumer. Although the average rate of excise tax on spirits was higher than that of beer and wine, the difference was not enough to offset the additional costs of producing and delivering beer to the consumer. The average retail price (including taxes) of a litre of alcohol in beer is €84 compared to €77 for wine and €65 for spirits. Any move towards taxing all drinks based solely on alcohol content (unitary taxation) would therefore disadvantage beer further in terms of the cost of the product to the consumer.

Table of Contents

Chapter I

Impact of tax changes

PRICEWATERHOUSECOOPERS

Index

Key findings

PRICEWATERHOUSECOOPERS

Key findings

PricewaterhouseCoopers Asesores de Negocios, S.L. (PricewaterhouseCoopers or PwC) has undertaken an analysis for The Brewers of Europe into the impact of an increase in excise taxes across the European Union (EU). The analysis considers the impact on consumption, Government revenues, profitability in the brewing sector and direct and indirect employment.

The main results from our analysis are the following:

- **First.** We have found evidence of different impact of excise tax rises in the on-trade (bars, restaurants, etc.) and off-trade (supermarkets, hypermarkets, etc.) distribution channels. In particular, excise tax rises are in general more than passed-through into on-trade prices. This means that prices are increased by more than the amount of the tax rise. In the off-trade channel, retail prices are increased either by the same amount of the tax rise or by less of this amount.

- **Second.** There is also evidence on different sensitivities to prices on-trade and off-trade. In particular, the demand for beer is more elastic (i.e., more price-sensitive) in the on-trade channel. This means that the same percentage increase in prices leads to a higher fall in consumption on-trade than off-trade.

- **Third.** Taking into account both effects (higher rate of pass-through and elasticity in the on-trade channel), excise tax increases are likely to have a larger negative effect on on-trade consumption. In this regard, there is currently a shift within the EU from on-trade to off-trade consumption. This trend could be explained by income effects, i.e. consumers diverting purchases from higher price – beer on-trade – to lower price goods – beer off-trade – in response to adverse economic conditions, or by a change in consumer tastes. Excise duties can contribute to this trend as beer consumption in the on-trade channel becomes less affordable.

- **Fourth.** There is evidence that increases in excise tax revenue (resulting from rises in the excise tax rate) are, at least in the short term, more than offset by decreases in the revenues obtained by the Government from personal and corporate income taxes, social security payments and, in some cases, also from value added tax (VAT). Our calculations show that a rise of 20% in excise taxes in the countries considered in the study would lead in aggregate to a fall in Government revenues of over EURO 115 million. Even excluding additional social security costs from subsequent job losses, this 20% rise would only lead to an increase in overall government revenues from beer sales of less than 1%.

- **Fifth.** The impact of the increase in the excise tax rate on industry profitability is more than proportional to the reduction in consumption, due to the importance of fixed costs in the beer industry. According to our calculations, if excise taxes were raised by 20% in the whole of the EU, beer consumption would fall by 3.32%, while the profits of the beer industry would drop by more than 10%, due to a combination of lower margins and reduced volumes. This will result in job losses and could lead to a reduction in investment.

- **Sixth.** Any significant rise in the excise tax rate invariably leads to a reduction in employment across the beer supply chain. According to our estimates, an increase by 20% in beer excise taxes would lead to over 70,000 jobs losses, the majority in the on-trade distribution channel.

- **Seventh.** Our analysis shows that the unitary taxation system would have, at least in the short run, a negative impact on the budget of Governments, and a very negative and long-lasting effect on industry employment and profitability. Across the EU, Government revenues would fall by over EURO 750 million, the profitability of brewers would be halved, and over 420,000 jobs would be lost.

- **Eighth.** There is some evidence of substitution between beer and other alcoholic drinks in response to variations in their relative prices. In particular we have found evidence of substitution between beer and spirits and/or wine in some countries. Where this is the case, the

introduction of a unitary taxation policy, or any other selective rise on beer taxes, would lead to a reduction in beer consumption to the benefit of other alcoholic drinks. This means that a part of the beer consumption foregone would be diverted to other alcoholic drinks.

Ninth. There are significant differences between the markets analyzed in this study. The own price elasticity for beer varies considerably by country and by trade channel (on-trade and off-trade), as does the rate of pass-through of tax increases into final retail prices. This highlights the importance of considering the impact of excise duty rates, and any subsequent changes to these, at individual Member State level, and taking into account the local characteristics of the market and the impact on the different stakeholders (Government, consumers, industry and employees).

1 Introduction

PRICEWATERHOUSECOOPERS

1. Introduction

PricewaterhouseCoopers has been retained by The Brewers of Europe to undertake an analysis into the impact of excise taxation on the beer industry. The Brewers of Europe has in particular requested PwC to quantify the effect of a variation of excise taxes on the following key variables:

- the consumption of beer and other alcoholic beverages, both on-trade (i.e., in bars, pubs and restaurants) and off-trade (supermarkets and hypermarkets);
- overall tax collection by national governments; and
- employment and profitability in the brewing sector.

Excise taxes on beer and other alcoholic beverages are normally justified on two grounds. Firstly, they are sources of funding for the Government. At the same time, Governments often cite health concerns as a reason for increasing excise taxes. The effectiveness of using taxes to tackle harmful alcohol consumption is beyond the scope of this report.

Governments across the EU have been increasing taxes on beer over recent years. For instance, the British Government has been raising beer taxes on a yearly basis since 2003, with the only exception of 2008, when taxes were increased twice (in March and again in December). Overall, the excise tax on beer has grown by 34.8% (4.4% annually) between April 2003 and April 2009. VAT and excise taxes now account for 33.6% of the average price paid for a litre of beer in the United Kingdom (UK).[1]

In other countries where beer taxes had remained unchanged for a number of years, the national governments have recently decided to increase the level of taxes substantially – e.g. Netherlands: +30% in 2008; Finland: +10% in 2008, +10% in January 2009, and a further +10% in October; Poland: +13.6% in 2009, Hungary and Estonia: +10% in January 2010, Greece: three tax rises in the first half of 2010. The Governments of other countries are also considering significant excise tax rises.

Although the situation varies from country to country, this increase in fiscal pressure has not affected all alcoholic drinks, and in particular wine. According to the data from the European Commission, the wine industry benefits from a EURO 0.00 excise tax rate in 15 member States (Austria, Bulgaria, Cyprus, Czech Republic, Germany, Greece, Hungary, Italy, Luxembourg, Malta, Portugal, Romania, Slovakia, Slovenia, and Spain), and excise is a very small amount in France.

The European Commission is now also evaluating possible reforms of the community tax policy on alcoholic beverages. One of these reforms may consist of a single or unitary tax per litre of pure alcohol that would apply to any non-exempted alcoholic beverage (and in particular to beer and spirits). Depending on how it is implemented, this reform could lead to a significant increase in the level of the excise tax per litre of beer.

This report presents the results of the analysis undertaken by PwC. We have considered three different scenarios of variation in excise taxes in the impact analysis:

1. Scenario 1: excise taxes on beer are increased by 20%;
2. Scenario 2: excise taxes on beer are reduced by 20%; and

[1] According to the data provided by Nielsen, the average price paid for a litre of beer in the United Kingdom amounted to GBP 3.51 in March 2009. The current level of the excise tax on beer is GBP 0.6588 per litre (4% alcohol by volume), and the value added tax (VAT) rate is 17.5% (source: British Government – HM Revenue and Customs).

3. Scenario 3: introduction of a unitary taxation system in which the excise tax per litre of pure alcohol is set to the current level of excise taxes for spirits.

Detailed individual impact analyses have been carried out for the beer markets of 7 EU Member States, in particular, Czech Republic, Finland, France, Germany, Poland, Spain and the United Kingdom. This sample of countries is considered representative of the whole of the EU, and accounts for about 70% of European beer consumption by volume.[2] The results achieved at the country level have been extrapolated to obtain estimates of the impact of the selected policy scenarios at the EU level.

This chapter is structured in two additional sections. In section 2, we describe our impact analysis methodology. Section 3 presents the main results. The appendices to the report provide further details on the methodology and results of the analysis.

[2] These seven countries account for 70.7% of total consumption in the 20 EU markets covered by market research company Datamonitor (Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the UK).

2 Methodology

PRICEWATERHOUSECOOPERS

2. Methodology

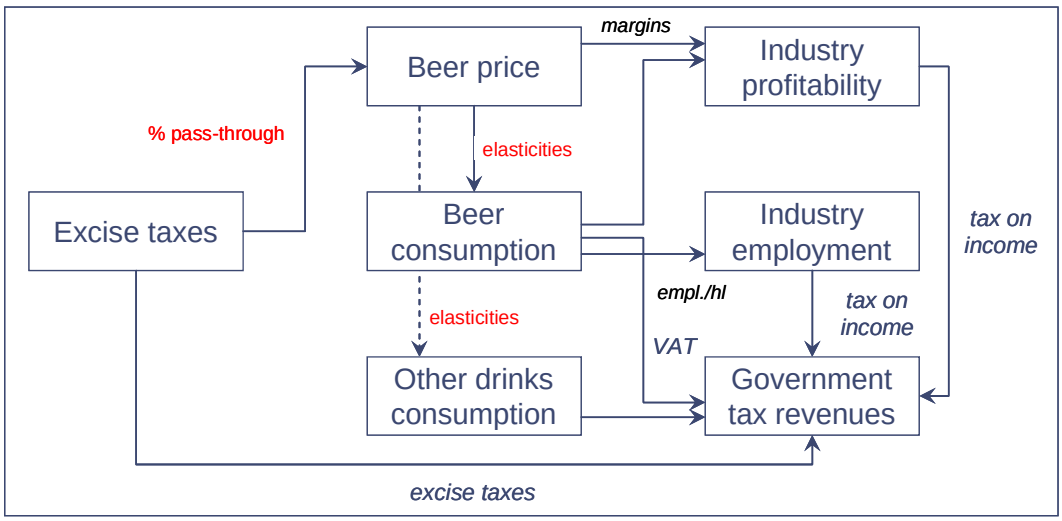
This section is aimed at describing our impact analysis methodology. Further detail is also provided in the appendices. We first provide an overview of the possible effects of a variation in excise taxes (see subsection 2.1). Then we move to explain how each one of these effects is measured. In particular, we present our methodology to calculate the impact of excise taxes on prices (see subsection 2.2), consumption (subsection 2.3), employment, profitability and Government revenues (subsection 2.4). We finally provide an overview of the methodology used for the selection of the sample of countries for the study (see subsection 2.5).

2.1 Overview

Our analysis is aimed at quantifying the impact of different scenarios of excise tax policy on consumption, Government revenues, and industry profitability and employment.

The impact of a variation in excise taxes on each one of the variables mentioned above is the result of a combination of effects (see Figure below).

Figure 2-1 Impact of excise taxation – identification of possible effects



Source: PwC analysis.

Impact on prices

The most direct effect of a variation in excise taxes for beer is on beer prices. Excise taxes are usually paid directly by the brewer. If there is a rise in excise taxes, the brewer has to decide how much of this tax rise is passed through into prices to their customers (e.g. wholesalers, supermarkets or pub owners). These will in turn decide any change in the price they charge to the final consumer. This is generally assessed on a case by case basis and depends on many factors including competition within the market place, the current economic climate and its impact on disposable incomes, the impact of raw materials and other cost components, along with general consumer price sensitivity. All of these factors may influence the decision by the brewer and other agents in the beer supply chain to increase prices and whether and to what extent an excise tax rise can be passed on to the consumer without a corresponding adverse reduction in consumption and sales. The brewer, wholesaler or retailer could therefore decide to pass through only part of the tax rise, even if this is at the expense of a reduction in margins. Conversely, he could decide to increase prices by more than the tax rise to maintain a fixed gross margin.

The level of pass-through is a relevant issue that must be considered in our analysis. The methodology to estimate the level of pass-through is explained in subsection 2.2 below.

Impact on consumption

Any change in the price of a product or service – regardless of whether it is motivated by a variation of excise taxes or by other factors – is likely to have an impact on the level of consumption. In economics, the sensitiveness of consumption to variations in prices is normally measured by the elasticity of demand.

There are different concepts of elasticity. In what follows, we will focus specifically on the elasticities of the demand for beer.

The own price elasticity of demand measures the percentage change in the consumption of beer following a variation of one per cent in its price.[3] For instance, an estimated own price elasticity of -0.5 indicates that an increase by 1% in the price of beer would lead to a decrease of 0.5% in the level of consumption. Increases in the price of any good will lead to variations of opposite sign (i.e., decreases) in its consumption. The own price elasticity of demand is therefore expected to be negative (lower than zero). Broadly speaking, the demand for a good is considered to be elastic if its own price elasticity is greater than -1 (in absolute value), and inelastic in other case.

The cross price elasticity measures the percentage change in the consumption of beer following a variation by 1% in the price of another good.[4] For example, if the elasticity of the demand for beer to the price of soft drinks is equal to 0.5, this means that an increase of 1% in the price of soft drinks would lead to an increase of 0.5% in the consumption of beer. If two goods are substitutes, an increase in the price of one will lead to an increase in the consumption of the other, and the cross price elasticity is expected to be positive (greater than zero). The cross price elasticity will be negative for complementary goods (i.e., goods that are consumed together in fixed proportions, like coffee and sugar), and zero for goods with unrelated demands.

The magnitude of the impact of an excise tax change on industry employment and profits and on Government revenues will be a combination of both a price and a volume effect. For instance, an increase in the excise tax rate will lead in general to an increase in the amount collected by the Government from each litre of beer sold (i.e., will have a positive price effect). However, if the tax rise is passed-through and prices increase, it will have a negative impact on consumption, and the number of litres of beer over which the tax is collected will fall (i.e., there will be a negative volume effect). The net impact of the tax rise on Government revenues will depend on the relative magnitude of these two effects.

Similarly, an increase of taxes that is passed-through into prices and does not affect unit margins (i.e., has a neutral price effect), can still lead to a drop in consumption and affect negatively the total profit made by the brewing industry.

The sensitiveness of consumption to prices is therefore a relevant issue in our analysis. The methodology to estimate demand elasticities is explained in subsection 2.3 below.

[3] The mathematical expression of the own price elasticity of demand is the following:

$$\varepsilon_x = \frac{\partial q_x}{\partial p_x} \times \frac{p_x}{q_x}$$

where q_x and p_x are, respectively, the quantity sold and the price of good x, and $\partial q_x/\partial p_x$ is the marginal variation in the quantity of good x sold following a marginal variation in its price.

[4] The mathematical expression of the cross price elasticity of demand is the following:

$$\varepsilon_{xy} = \frac{\partial q_x}{\partial p_y} \times \frac{p_y}{q_x}$$

where q_x and p_y are, respectively, the quantity sold of good x and the price of good y, and $\partial q_x/\partial p_y$ is the marginal variation in the quantity of good x sold following a marginal variation in the price of y.

The methodology to calculate the impacts on industry employment and profits and on Government revenues is presented in subsection 2.4.

2.2 Level of pass-through

Our estimate of the level of pass-through has been obtained from an analysis of historical data. In particular, we have calculated which has been the impact of past variations of tax rates on beer prices in the different countries under analysis.

Any variation in prices observed following an increase in excise taxes is not necessarily explained in its entirety by the tax rise. Other factors that have an effect on prices, like increases in operating costs, can also explain a part of these price movements. For this reason, we have used econometrics for the analysis of historical data. The advantage of using econometrics is that we can isolate the impact of the excise tax rises from the remaining cost factors that also have an effect on prices. The cost factors considered in our analysis are, in addition to excise taxes, labour and raw materials costs.[5]

The details of the econometric models used in this analysis are included in Appendix A.

2.3 Demand elasticities

Our estimates of demand elasticities are also based on the analysis of historical data. In particular, we have estimated the impact of past variations in prices on beer consumption.

Demand elasticities cannot be inferred directly from data on beer consumption and prices, since consumption is affected by other variables different from beer prices, such as the price of substitutes, or the disposable income of consumers. This means that any change in consumption observed following a variation in prices could be explained in part by the evolution of these other variables. Any attempt to estimate demand elasticities without taking into account their influence could lead to misleading results.

We have therefore used econometric techniques for the analysis of the historical data on beer consumption and prices. As explained above, by using econometrics, we can isolate the impact on consumption of a particular variable, such as beer prices. In the analysis, we have also considered the possible effect on consumption of variations in the price of potential substitutes of beer, in particular, spirits, wine and soft drinks, and income.[6] With econometrics, we can also obtain simultaneously estimates of the own and cross-price elasticities required for the impact analysis.

[5] In our model, the evolution of beer prices is explained as a function of labour and raw materials costs, and excise taxes. In particular countries, we had to use a different model specification. For instance, in the UK, the British Government decided to temporarily lower VAT rates in December 2008. The UK pass-through model includes an additional (artificial or dummy) variable to account for this effect. In Spain, we could not obtain reliable proxies for labour and raw materials costs. In this particular case, we used time-series (ARIMA) modelling and intervention analysis techniques to obtain our estimates of pass-through effects.

[6] In our model, beer consumption is a function of beer prices, the price of potential substitutes, and the disposable income of consumers. The substitutes considered in the analysis vary from country to country, depending on which is the most popular drink (e.g., vodka in Finland, Poland, and the UK; whisky in Spain), and the information available. In this last regard, it should be noted that data on soft drink prices was only available for Spain and the UK. In France, Germany and the Czech Republic, we could not obtain data on the price of other alcoholic drinks different from beer. In these countries, beer consumption is explained as a function of beer prices and income. In some countries, we have also considered the impact of climate conditions and, in particular, of temperature, on consumption. Temperature is not a relevant determinant of consumption once that seasonal effects have been considered by including monthly or quarterly artificial or dummy variables, or by taking inter-annual differences.

The details of the econometric models used in this analysis are included in Appendix B.[7]

2.4 Impact on employment, profitability and Government revenues

2.4.1 Impact on employment

We have considered the impact on both direct and indirect employment generated by the beer industry. We understand direct employment as the total workforce contracted by the brewing companies directly. Indirect employment is the number of jobs generated by the beer industry in related sectors, i.e., those that supply products or services to the brewing companies (producers of barley and malt, transport companies, etc.) or distribute beer to final consumers (bars, restaurants, supermarkets, etc.).

Figures on employment have been provided by The Brewers of Europe. They are based on estimates from Ernst & Young. Employment is measured in equivalent full-time jobs.

In the analysis, we assume that consumption is the main driver of employment in the beer industry. This assumption is strongly supported by empirical evidence.

The Figure below shows the relationship between consumption and direct employment in the European brewing sector. The data in the Figure are for 20 EU Member States[8] and have been taken from Datamonitor (consumption) and The Brewers of Europe (estimates of direct employment by Ernst & Young).[9]

The correlation between direct employment and consumption is 0.96 (close the maximum of 1.00).[10] This means that there is an almost perfect positive linear relationship between employment and consumption, and that the level of employment in a Member State can be inferred quite precisely from its level of consumption.

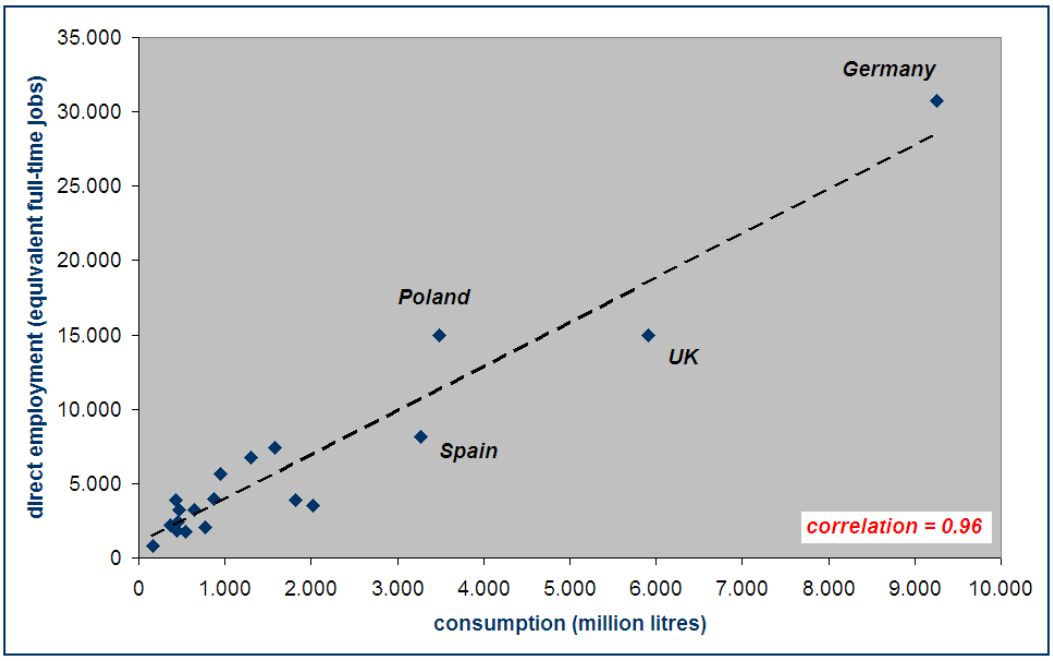
[7] It should be noted that the estimation of demand elasticities poses difficulties that in some cases cannot be resolved with standard econometric techniques. In particular, the fact that producers set their prices taking into account the reaction of consumers, and consumers decide their levels of consumption taking into account the price of the producer, gives raise to problems of simultaneity and endogeneity. In the presence of endogeneity, the use of standard estimation techniques, like ordinary least squares (OLS), leads to biased and inconsistent results. For this reason, we have used instrumental variables (two stages least squares – 2SLS) estimation techniques in those cases in which endogeneity problems have been found.

[8] The 20 EU Member States covered by Datamonitor. See footnote 2 in page 8.

[9] Data on consumption are for year 2007 (the latest year available from Datamonitor at the time this analysis was carried out), while data on employment are for year 2008. The consideration of data on consumption for year 2008 has not any material impact on the results of the analysis. We have also estimated the relationship between consumption and employment by using data provided by The Brewers of Europe (based on estimates from Ernst & Young) for year 2008. The correlation between employment and consumption is 0.97. The impacts of a variation of 10% in consumption on direct and indirect employment are, respectively, 6.90% and 9.92%.

[10] The correlation coefficient is a statistical measure of the degree of linear relationship between two variables (e.g., consumption and prices). It can take values in the range from -1 to 1. The larger the correlation coefficient (in absolute value), the stronger the relationship between the two variables. A correlation coefficient of -1 indicates that there is a perfect negative linear relationship between the variables (i.e., any change in the level of one variable is followed by a variation of opposite sign and fixed amount in the other). A correlation of 1 is indicative of a perfect positive linear relationship between the variables (i.e., changes in the value of one variable are followed by variations of the same sign and fixed amount in the other). A correlation of 0 means that the two variables are not linearly related. The correlation between beer consumption and employment is robust to the exclusion of countries with larger levels of consumption from the sample.

Figure 2-2 Relationship between beer consumption and direct employment



Source: Datamonitor (consumption) and The Brewers of Europe (based on estimates from Ernst & Young, direct employment).

We have undertaken an econometric simple regression analysis to estimate the precise impact of beer consumption on direct employment from the data in the Figure above (see Appendix C for details).[11] According to our estimates, a decrease in beer consumption by 10% would lead to a decrease in direct employment of 7.67%.

The correlation between beer consumption and indirect employment is even higher, 0.98 (see Figure 2-3). According to our estimates (also based on regression analysis), a drop by 10% in consumption would lead to a decrease in indirect employment of 9.60%.[12]

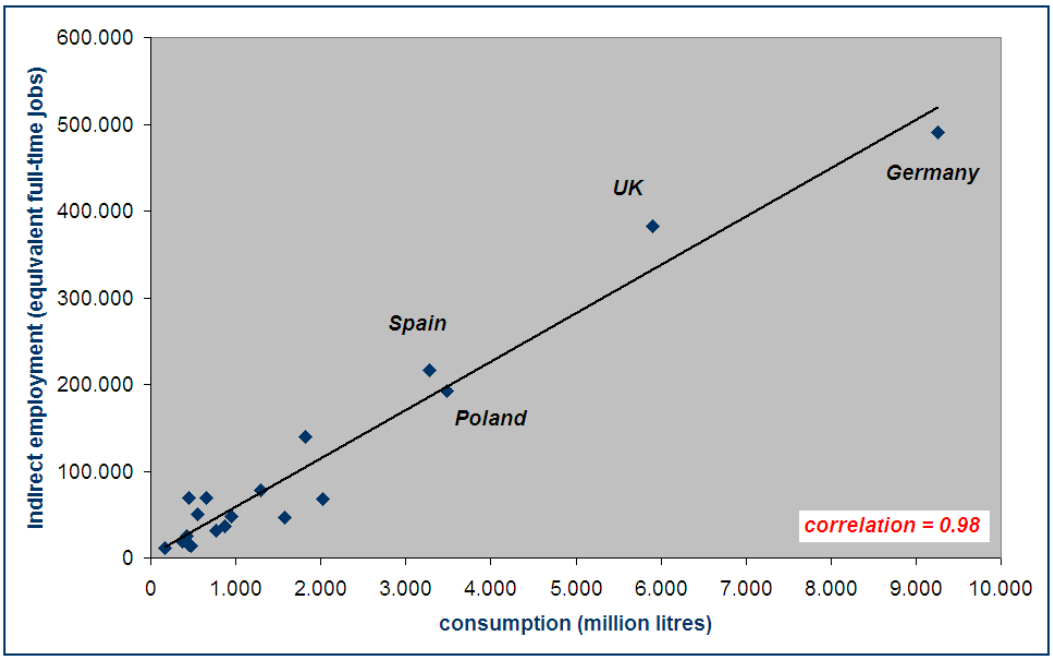
The difference between the impact on direct and indirect employment is explained by the different flexibility of the brewing sector and other related sectors to adjust their workforce following reductions in the level of activity. In particular, most of the indirect employment generated by the brewing industry is in the hospitality sector,[13] where temporary workers are a significant part of total workforce.

[11] For the regression, data on consumption and employment have been expressed in logarithms to obtain an estimate of the percentage variation in employment following a 1% fall in consumption. The R-square of the regression is 0.8393, which means that consumption explains 83.93% of the variability of direct employment. The coefficient estimated for consumption is statistically different from 0 at any confidence level (p-value of 0.000).

[12] The R-square of the regression is 0.8427. The coefficient estimated for consumption is different from 0 at any confidence level (p-value of 0.000).

[13] According to the data provided by The Brewers of Europe (based on Ernst & Young estimates), 78.0% of the indirect employment generated by the brewing industry is in the hospitality sector.

Figure 2-3 Relationship between beer consumption and indirect employment



Source: Datamonitor (consumption) and The Brewers of Europe (based on estimates from Ernst & Young, indirect employment).

Table 2-1 shows the data available on the evolution of consumption and total (direct and indirect) employment in the seven countries considered in our study from 2004 to 2008. These data are not sufficient to estimate the actual (long-term) impact of consumption on employment. In particular, data on employment is only available for years 2004 and 2008 (not for years 2005, 2006 and 2007), and the relationship between change in employment and consumption calculated could be affected by temporary disequilibria due to workforce adjustment costs, cyclical patterns of consumption, or the anticipated evolution of sales. Notwithstanding, these data are useful to check whether the impacts estimated from the cross-country comparison are of a reasonable order of magnitude.

Table 2-1 Evolution of employment and consumption in selected EU countries

Country	Employment ('000)			Consumption (million hl)			implied elasticity
	2004	2008	% inc	2004	2008	% inc	
Czech R.	76.0	54.5	-28.3%	17.9	16.2	-9.3%	3.05
Finland	19.5	17.5	-10.3%	4.9	4.7	-4.6%	2.21
France	91.7	71.5	-22.0%	20.2	18.8	-7.0%	3.13
Germany	549.6	521.2	-5.2%	95.5	91.0	-4.7%	1.10
Poland	186.0	207.9	11.8%	28.8	36.9	28.1%	0.42
Spain	220.2	225.1	2.3%	33.5	35.7	6.4%	0.35
UK	450.0	397.2	-11.7%	60.3	51.3	-14.9%	0.79
TOTAL	**1,592.9**	**1,494.9**	**-6.1%**	**261.1**	**254.5**	**-2.5%**	**2.45**

Source: PwC analysis, The Brewers of Europe (based on estimates from Ernst & Young).

The ratio between the percentage variations of total employment and consumption (in the Table, implied elasticity) ranges from 0.35 to 3.05 (average of 2.45). An implied elasticity of 0.35 indicates that a 10% fall in consumption leads to a 3.5% reduction in employment. The impacts estimated from the cross-country comparison (implied elasticities of 0.767 and 0.960 for direct and indirect employment, respectively) are in this range, and below the average for the seven countries under analysis. Therefore, these impacts seem to be of a reasonable order of magnitude (and maybe a bit conservative).

Following the above, we consider that each percentage point of reduction in consumption in any of the countries covered by our study leads to 0.767 percentage points of reduction in direct employment, and to 0.960 percentage points of reduction in indirect employment.

2.4.2 Impact on profitability

If the price of beer is over its production cost, every reduction of one litre in the volume of beer sold will lead (other things equal) to a reduction in industry profits.

This reduction in profits is equal to the difference between the revenue or price per litre, and the avoided costs of production. Avoided costs are those which are not incurred if the litre of beer is not produced and sold. These are typically variable costs, like energy, raw materials (water, barley, etc.) or transport costs. Avoided costs do not include fixed costs (i.e., costs that do not vary with the level of production). One example of fixed costs is the investment in plant or machinery. Once a brewing company has invested in a production plant, any reduction in sales or consumption that leads to a situation of overcapacity will not affect the original cost of the plant (which has already been incurred). Labour costs can also be regarded fixed to a certain extent, in particular in areas of the company such as administration (accounting, human resources, etc.) or management.

The Table below shows our estimates of the profit loss per litre of beer not sold for each of the countries considered in the study. Further details on the methodology to analyze the impact on profitability are in Appendix D.

Table 2-2 Profit loss per litre of beer not sold in selected EU countries

Country	loss of profit (EURO/litre)
Czech R.	0.13
Finland	0.32
France	0.12
Germany	0.18
Poland	0.04
Spain	0.26
UK	0.24

Source: PwC analysis.

In our analysis, we have not taken into account the likely effects of the variation in excise taxes on other financial performance indicators of the brewing industry, like investments, nor the impact on the profits of other related industries.

Notwithstanding, it should be noted that any measure that affects negatively the profits of the beer industry is likely to have a negative effect on its level of investment. Moreover, to the extent that the fall in beer consumption affects negatively the activity of other related sectors, it will also have negative effects on the profitability of these sectors.

2.4.3 Impact on tax revenues

We have considered the impact on the following sources of revenue for the Government:

- Excise taxes.
- VAT.
- Tax on corporate income.
- Tax on personal income.
- Contributions to Social Security.

Our analysis only measures the impact on the revenues obtained by the Governments from beer sales. Revenues from other alcoholic drinks are not considered.

The main assumptions in our analysis of impact on Government revenues are presented in Appendix E. Figures on VAT and corporate income tax rates have been taken from the European Commission. The average contributions per employee to total personal income tax collection and social security have been provided by The Brewers of Europe, and are based on estimates from Ernst & Young.

We have also considered the cost for the Government of the unemployment benefits that should be paid to employees who would loose their jobs following an excise tax rise. This cost has been estimated from the average duration of unemployment and the amount of the unemployment benefit. The details of this calculation are presented in Appendix E.

2.5 Selection of countries

Our methodology for the selection of the sample of countries for the study is aimed at ensuring that countries are selected attending to criteria of representativeness, so as to facilitate the extrapolation of the results of the study to the whole of the EU.

Broadly speaking, our methodology comprises two major stages:

- First, the set of countries initially considered as candidates for the sample are divided into 7 clusters of countries regarded similar or homogeneous.
- Second, one representative country is selected from each cluster.

The Figure below shows the resulting clusters and the sample of countries selected for the study, which comprises Czech Republic, Finland, France, Germany, Poland, Spain and the UK.

A full explanation of the approach taken and the variables considered is in Appendix F.

Figure 2-4 Countries selected from each cluster

Country	Beer volume (*)	Country	Beer volume (*)
cluster 1:		**cluster 3:**	
• Austria	870.70	• Belgium	953.00
• Hungary	771.10	• Netherlands	1,297.50
• Slovakia	368.20	• Denmark	427.10
• **Czech Republic**	**1,572.90**	• **France**	2,019.10
• Greece	446.50	**cluster 5:**	
• Portugal	647.30	• Ireland	548.20
cluster 2:		• **United Kingdom**	**5,903.10**
• **Finland**	**450.10**	**cluster 6:**	
• Sweden	469.50	• **Poland**	**3,486.40**
cluster 4:		• Romania	1,954.10
• Italy	1,815.30	**cluster 7:**	
• **Spain**	**3,274.60**	• **Germany**	**9,253.40**

(*) In millions of litres

Source: PwC analysis, Datamonitor (consumption).

3 Main results

PRICEWATERHOUSECOOPERS

3. Main results

This section presents the main results from our analysis. It is structured in 3 subsections. First, we present our estimates of the level of pass-through and demand elasticities for the different countries considered in the study (see subsections 3.1 and 3.2). The results of the impact analysis at the country and EU-level are presented in subsection 3.3.

3.1 Level of pass-through

There is little previous empirical work on the level of pass-through and the impact of excise tax variations on prices. The most relevant reference is the study undertaken by OEF (Oxford Economic Forecasting) for The British Beer and Pub Association in 2004. In this study, OEF analyzes the evolution of beer prices in the UK between the first quarter of 1986 and the fourth quarter of 2003.

Our estimates of pass-through levels (see Table 3-1) are consistent with the findings of OEF.[14] In particular, we find that the impact of a variation in excise taxes in the on-trade channel is different from (larger than) the effect of the same variation in the off-trade channel. Data on prices split by distribution channel was only available for Finland, Spain, and the UK. In these countries, the estimated levels of pass-through are positive in the on-trade channel and zero or negative in the off-trade channel. The pass-through levels estimated in the on-trade and off-trade channels for Finland are, respectively, 0.216 and 0.000. This means that a rise by 1% in excise taxes in Finland would lead to an increase by 0.216% in the price (net of excise taxes) of beer on-trade. Put another way, the price inclusive of tax rises by more than the excise tax increase. The net price of beer off-trade would remain unchanged. In Spain, a 1% rise in the excise tax rate would lead to a 0.114% increase of the net on-trade price, and would not affect significantly the net off-trade price. The estimated pass-through levels for the UK are similar to those reported by OEF (0.420 on-trade, -0.293 off-trade, as compared to 0.5 and -0.3 estimated by OEF).

In the case of France and Poland, we only had sufficiently detailed information on prices for the off-trade channel, since market research companies (e.g., Nielsen) do not provide reliable on-trade data in these countries. The levels of pass-through reported in the Table for these two countries (0.000) are therefore estimates for the off-trade channel, although in the impact analysis we have considered this same level of pass-through for the on-trade channel. This assumption is regarded conservative (in that it probably leads to underestimate the magnitude of the impact) since, according to the evidence available, pass-through effects in the on-trade channel are probably higher. In the Czech Republic and Germany, there have not been changes in excise taxes along the period covered by the data on prices available. We have therefore assumed that the level of pass-through is also 0.000. This means that, following a rise in excise taxes, the price of beer in all these countries would increase by the same amount of the tax rise (or, what is the same, the price net of excise taxes would remain constant).

[14] See Appendix G for a description of the data available for each one of the countries and detailed results of the econometric estimates.

Table 3-1 Levels of pass-through estimated

Country	Pass-through on-trade	Pass-through off-trade
Czech Republic	0.000[e]	
Finland	0.216	0.000
France	0.000	
Germany	0.000[e]	
Poland	0.000	
Spain	0,114	0.000
UK	0.420	-0.293

Source: PwC analysis.

3.2 Demand elasticities

There is considerable more empirical work available on the sensitiveness of beer consumption to prices and on the elasticity of the demand for beer.

Gallet (2007) makes a compilation of the results from over 300 studies on this subject. He finds that the median own-price elasticity estimated by these studies for the demand for beer is -0.360. This indicates that 50% of the studies estimated an elasticity of -0.360 or lower, and 50% estimated an elasticity of -0.360 or higher. The author does not report the maximum, minimum and average values of the elasticity.

Wagenaar et al. (2009) survey over 100 studies. They find estimated values of the own-price elasticity of demand that range between -0.00 and -0.61.[15] The average own-price elasticity calculated from these studies is -0.46.

With quarterly data for the period between 1993 and 2006, Cooper and Logan (2007) find that, depending on the precise specification of the model, the value of the on-trade elasticity for beer ranged between -1.53 and -1.62. The elasticity of the off-trade demand was considerably lower (in the range between -0.64 and -0.96).[16]

Our estimates of the own-price elasticity of demand are reported in Table 3-2.[17] They are consistent with the results of the work by Cooper and Logan.

There was only data available for Spain and the UK to estimate elasticities by distribution channel. In both countries, the sensitiveness of demand to price is higher on-trade than off-trade. The values of the elasticities calculated for the UK are also in the range of those estimated by previous studies. The elasticities for Finland and Germany are total market elasticities. For France, Poland and the Czech Republic, elasticities are for the off-trade channel. In these three countries, we have considered the same elasticity for the on-trade channel. This assumption is regarded conservative (and probably leads to underestimate the magnitude of the impact) since, according to the evidence available, demand is more elastic on-trade than off-trade.

[15] One of the studies surveyed by Wagenaar et al. (2009) finds a positive (statistically significant) own price elasticity of demand. See Wagenaar et al. (2009), p. 184.

[16] Other papers that have been reviewed for the purpose of this study include the following: Crawford et al. (1999), Crooks (1989), Fogarty (2006), Huang (2003), Jones (1989), Kenkel (2005), Leung and Phelps (1993), Manning et al. (1995), Ornstein and Levin (1983), Salisu and Balasubramanyam (1997), Tsolakis et al. (1983), and Young and and Bielinska-Kwapisz (2002).

[17] See Appendix H for a description of the data available for each one of the countries and detailed results of the econometric estimates.

Table 3-2 Estimated elasticities of the demand for beer

Country	Own price elasticity		Substitutes of beer (*)
	On-trade	Off-trade	
Czech Republic	-1.144		
Finland	-0.765		Vodka
France	-1.352		
Germany	-0.568		
Poland	-1.490		Wine
Spain	-0.905	-0.835	Whisky, still wine
UK	-1.267	-1.146	Vodka, light wine

NOTE: (*) Cross price elasticity positive and statistically significant (different from zero).
Source: PwC analysis.

There are notable differences across countries. In particular, the demand for beer seems to be relatively elastic (higher than -1 in absolute value) in the Czech Republic, France, Poland and the UK, and inelastic in Finland, Germany and Spain. The range varies from -0.568 in Germany to -1.49 in Poland.

We have also found evidence of substitution between beer and other alcoholic drinks in response to changes in their relative prices in Finland, Poland, Spain and the UK. The data available for the remaining three countries covered by our study was not sufficient to estimate cross-price elasticities.

Finally, we have observed a shift of beer consumption from the on-trade to the off-trade channel in those countries with data split by distribution channel.[18] Our analysis of cross-price elasticities shows that this shift is not motivated by changes in the relative prices of beer in both channels.[19] This suggests that it is mainly the result of an income effect (consumers diverting purchases from higher price – beer on-trade – to lower price goods – beer off-trade – in response to adverse shocks in economic conditions), or of a change in consumer preferences.

3.3 Impact analysis

3.3.1 Results at the EU-level

The results at the EU-level are presented in Table 3-3. EU estimates are the result of extrapolating the impacts calculated at the country level. In particular, we assume that the results for each country are representative of the whole of its cluster. Then we calculate a weighted average impact at the EU level.[20]

The first column in the Table shows the current level of beer consumption, employment, profitability and Government tax revenues from beer sales. Subsequent columns show the impact on these variables of a 20% change in beer excise rates, and the impact if beer excise rates were increased to the level of the excise tax for spirits (unitary taxation). The impact in terms of social security payments under these scenarios is also highlighted. The percentage variations of Government

[18] In particular, in the UK, the proportion of beer consumed off-trade has grown by 4.3 percentage points, from 37.2% in 2006 to 41.5% in 2008. In Spain, the weight of off-trade sales has grown 1.7 percentage points (from 39.3% to 41.0%) over the same period. Source: Nielsen.

[19] Cross elasticities of the demand of beer on-trade with respect to the price of beer off-trade, and of the demand for beer off-trade with respect to the price of beer on-trade found not statistically different from zero (p-value larger than 0.100).

[20] In the case of consumption and profits, the average is weighted by sales in volume. In the case of employment, the average is weighted by the number of employees.

revenues of the Table do not take into account the cost of unemployment benefits for the Government. These are shown exclusively in the country-level Tables of subsection 3.3.2.

Table 3-3 Results of the impact analysis at EU-level

Excise tax scenario:	Current level	20% decrease		20% increase		unitary taxation	
Consumption (,000 litres)	36,528	37,742		35,314		29,086	
-Variation		1,214	3.32%	-1,214	-3.32%	-7,442	-20.37%
Direct employment	131,067	134,320		127,814		109,139	
-Variation		3,253	2.48%	-3,253	-2.48%	-21,928	-16.73%
Indirect employment	2,079,388	2,148,686		2,010,090		1,678,650	
-Variation		69,298	3.33%	-69,298	-3.33%	-400,738	-19.27%
Profits	-						
-Variation	-		11.75%		-11.75%		-66.30%
Government revenue							
- Variation			**-1.36%**		**0.85%**		**6.74%**

Source: PwC analysis.

In relation to a 20% increase in beer excise taxes across the EU, our analysis shows that this will result in:

- Reduced sales by over 1.2 billion litres of beer (-3.32%).
- Over 70,000 direct and indirect jobs lost (-3.28%).
- Brewing industry profitability going down by more than 10%.
- Increase in total Government tax revenues of less than 1%, excluding additional social security payments (i.e., the cost of unemployment benefits).
- Decrease of total government tax revenues of 116.8 million in the first year, if the cost of unemployment benefits is taken into account.[21]

A move to unitary taxation by increasing beer excise tax to the rate of spirits would have a further significant impact, with the loss of over 420,000 jobs from reduced beer sales across Europe.

3.3.2 Results at the country level

Table 3-4 below presents the results of the impact analysis at the country level.

[21] This figure has been calculated as the sum of the net impacts reported in the country-level Tables of subsection 3.3.2 for the seven countries considered in the analysis.

Table 3-4 Results of the impact analysis at the country level

Czech Republic:

Excise tax scenario:	Current level	-20%		+20%		unitary taxation	
Excise tax (€/litre)	0.1203	0.0962		0.1443		0.4810	
Consumption (litres)	1,624,000,000	1,660,787,759		1,587,212,241		1,072,243,329	
-Variation		36,787,759	2.27%	-36,787,759	-2.27%	-551,756,671	-33.98%
Direct employment	7,400	7,529		7,271		5,471	
-Variation		129	1.74%	-129	-1.74%	-1,929	-26.07%
Indirect employment	47,084	48,109		46,060		31,720	
-Variation		1,024	2.18%	-1,024	-2.18%	-15,364	-32.63%
Profits (€)	-						
-Variation	-	4,920,288		-4,920,288		-73,796,327	
Excise tax (€)	133,000,000	108,810,233		155,984,651		351,223,615	
-Variation		-24,189,767	-18.19%	22,984,651	17.28%	218,223,615	164.08%
VAT (€)	232,406,723	232,921,927		231,699,105		201,594,717	
-Variation		515,204	0.22%	-707,618	-0.30%	-30,812,006	-13.26%
Corporate income (€)							
- Variation	-	984,058		-984,058		-14,759,265	
Personal income & SS (€)	307,956,612	314,450,914		301,462,310		210,552,622	
-Variation		6,494,302	2.11%	-6,494,302	-2.11%	-97,403,990	-31.63%
Government revenue (€)							
- Variation		**-16,196,204**	**-2.32%**	**14,798,674**	**2.12%**	**75,248,354**	**10.77%**
Unemployment benefit (€)	-			-5,071,107		-76,058,368	
Net increase year 1 (€)	-			***9,727,567***		***-810,014***	

Finland:

Excise tax scenario:	Current level	-20%		+20%		unitary taxation	
Excise tax (€/litre)	1.3000	1.0400		1.5600		1.7900	
Consumption (litres)	440,044,774	467,479,068		412,610,480		388,341,681	
-Variation		27,434,294	6.23%	-27,434,294	-6.23%	-51,703,093	-11.75%
Direct employment	2,283	2,392		2,173		2,077	
-Variation		109	4.78%	-109	-4.78%	-206	-9.02%
Indirect employment	14,146	14,993		13,298		12,549	
-Variation		847	5.99%	-847	-5.99%	-1,596	-11.28%
Profits (€)	-						
-Variation	-	8,791,841		-8,791,841		-16,569,239	
Excise tax (€)	492,056,075	418,186,383		553,655,005		597,917,707	
-Variation		-73,869,692	-15.01%	61,598,931	12.52%	105,861,632	21.51%
VAT (€)	403,022,117	394,045,598		408,366,047		410,065,317	
-Variation		-8,976,519	-2.23%	5,343,930	1.33%	7,043,200	1.75%
Corporate income (€)							
- Variation	-	2,285,879		-2,285,879		-4,308,002	
Personal income & SS (€)	310,042,351	328,006,872		292,077,830		276,186,139	
-Variation		17,964,521	5.79%	-17,964,521	-5.79%	-33,856,213	-10.92%
Government revenue (€)							
- Variation		**-62,595,812**	**-5.15%**	**46,692,461**	**3.84%**	**74,740,618**	**6.15%**
Unemployment benefit (€)	-			-18,867,808		-35,558,560	
Net increase year 1 (€)	-			***27,824,654***		***39,182,057***	

France:

Excise tax scenario:	Current level	-20%		+20%		unitary taxation	
Excise tax (€/litre)	0.1320	0.1056		0.1584		0.7250	
Consumption (litres)	1,870,000,000	1,915,648,692		1,824,351,308		1,224,580,399	
-Variation		45,648,692	2.44%	-45,648,692	-2.44%	-645,419,601	-34.51%
Direct employment	3,550	3,617		3,483		2,610	
-Variation		67	1.87%	-67	-1.87%	-940	-26.49%
Indirect employment	67,914	69,506		66,321		45,401	
-Variation		1,592	2.34%	-1,592	-2.34%	-22,513	-33.15%
Profits (€)	-						
-Variation	-	5,366,983		-5,366,983		-75,882,916	
Excise tax (€)	312,000,000	255,693,002		365,260,497		1,122,184,760	
-Variation		-56,306,998	-18.05%	53,260,497	17.07%	810,184,760	259.67%
VAT (€)	1,067,741,137	1,071,092,655		1,063,890,360		1,005,338,239	
-Variation		3,351,518	0.31%	-3,850,777	-0.36%	-62,402,898	-5.84%
Corporate income (€)							
- Variation (€)	-	1,847,852		-1,847,852		-26,126,488	
Personal income & SS (€)	1,208,951,103	1,236,749,583		1,181,152,623		815,912,814	
-Variation		27,798,480	2.30%	-27,798,480	-2.30%	-393,038,289	-32.51%
Government revenue (€)							
- Variation (€)		**-23,309,148**	**-0.89%**	**19,763,388**	**0.75%**	**328,617,085**	**12.50%**
Unemployment benefit (€)	-			-37,032,138		-523,591,516	
Net increase year 1 (€)	-			***-17,268,750***		***-194,974,431***	

Table 3-4 Results of the impact analysis at the country level (continued)

Germany:

Excise tax scenario:	Current level	-20%		+20%		unitary taxation	
Excise tax (€/litre)	0.0984	0.0787		0.1181		0.6515	
Consumption (litres)	9,100,000,000	9,126,714,209		9,073,285,791		8,349,205,841	
-Variation	-	26,714,209	0.29%	-26,714,209	-0.29%	-750,794,159	-8.25%
Direct employment	30,737	30,806		30,668		28,791	
-Variation		69	0.23%	-69	-0.23%	-1,946	-6.33%
Indirect employment	490,461	491,844		489,078		451,596	
-Variation		1,383	0.28%	-1,383	-0.28%	-38,865	-7.92%
Profits (€)	-						
-Variation	-	4,917,226		-4,917,226		-138,197,041	
Excise tax (€)	313,000,000	251,135,081		374,497,378		1,901,373,493	
- Variation		-61,864,919	-19.77%	61,497,378	19.65%	1,588,373,493	507.47%
VAT (€)	3,982,016,807	3,977,669,465		3,986,305,465		4,080,196,756	
- Variation		-4,347,341	-0.11%	4,288,658	0.11%	98,179,950	2.47%
Corporate income (€)	-						
- Variation (€)		1,466,809		-1,466,809		-41,224,177	
Personal income & SS (€)	8,098,387,527	8,120,849,619		8,075,925,435		7,467,097,736	
- Variation		22,462,092	0.28%	-22,462,092	-0.28%	-631,289,791	-7.80%
Government revenue (€)							
- Variation		**-42,266,149**	**-0.34%**	**41,839,926**	**0.33%**	**1,013,555,785**	**8.07%**
Unemployment benefit (€)	-			-37,257,336		-1,047,105,309	
Net increase year 1 (€)	-			***4,582,590***		***-33,549,524***	

Poland:

Excise tax scenario:	Current level	-20%		+20%		unitary taxation	
Excise tax (€/litre)	0.2773	0.2218		0.3327		0.6035	
Consumption (litres)	3,579,450,758	3,740,382,186		3,418,519,329		2,632,618,363	
-Variation		160,931,428	4.50%	-160,931,428	-4.50%	-946,832,395	-26.45%
Direct employment	14,660	15,166		14,154		11,684	
-Variation		506	3.45%	-506	-3.45%	-2,976	-20.30%
Indirect employment	187,381	195,473		179,290		139,775	
-Variation		8,091	4.32%	-8,091	-4.32%	-47,606	-25.41%
Profits (€)	-						
-Variation	-	6,851,937		-6,851,937		-40,313,043	
Excise tax (€)	893,692,420	747,423,711		1,023,726,241		1,425,513,397	
-Variation		-146,268,709	-16.37%	130,033,821	14.55%	531,820,977	59.51%
VAT (€)	1,146,655,812	1,160,281,838		1,130,183,275		1,008,848,075	
-Variation		13,626,026	1.19%	-16,472,537	-1.44%	-137,807,736	-12.02%
Corporate income (€)	-						
- Variation		1,301,868		-1,301,868		-7,659,478	
Personal income & SS (€)	1,117,414,638	1,162,748,353		1,072,080,923		850,695,887	
-Variation		45,333,715	4.06%	-45,333,715	-4.06%	-266,718,751	-23.87%
Government revenue (€)							
- Variation		**-85,253,387**	**-2.69%**	**66,171,989**	**2.09%**	**115,200,577**	**3.64%**
Unemployment benefit (€)	-			-22,820,544		-134,263,586	
Net increase year 1 (€)	-			***43,351,444***		***-19,063,009***	

Spain:

Excise tax scenario:	Current level	-20%		+20%		unitary taxation	
Excise tax (€/litre)	0.0996	0.0797		0.1195		0.4151	
Consumption (litres)	3,560,000,000	3,623,427,516		3,496,572,484		2,967,416,987	
- Variation		63,427,516	1.78%	-63,427,516	-1.78%	-592,583,013	-16.65%
Direct employment	8,180	8,292		8,068		7,135	
- Variation		112	1.37%	-112	-1.37%	-1,045	-12.77%
Indirect employment	216,964	220,676		213,251		182,277	
- Variation		3,713	1.71%	-3,713	-1.71%	-34,687	-15.99%
Profits (€)	-						
-Variation	-	16,526,097		-16,526,097		-154,398,045	
Excise tax (€)	309,704,166	252,817,237		364,064,142		1,044,763,763	
- Variation		-56,886,929	-18.37%	54,359,976	17.55%	735,059,597	237.34%
VAT (€)	912,154,367	907,401,823		916,060,148		921,810,086	
- Variation		-4,752,544	-0.52%	3,905,781	0.43%	9,655,720	1.06%
Corporate income (€)	-	4,957,829		-4,957,829		-46,319,414	
- Variation							
Personal income & SS (€)	2,162,124,729	2,198,556,226		2,125,693,232		1,821,756,896	
- Variation		36,431,497	1.68%	-36,431,497	-1.68%	-340,367,833	-15.74%
Government revenue (€)							
- Variation		**-20,250,146**	**-0.57%**	**16,876,431**	**0.48%**	**358,028,070**	**10.15%**
Unemployment benefit (€)	-			-44,409,804		-414,906,599	
Net increase year 1 (€)	-			***-27,533,372***		***-56,878,529***	

Table 3-4 Results of the impact analysis at the country level (continued)

UK:

Excise tax scenario:	Current level	-20%		+20%		unitary taxation	
Excise tax (€/litre)	1.0342	0.8273		1.2410		1.4216	
Consumption (litres)	4,891,745,720	5,326,724,915		4,456,766,525		4,076,985,054	
-Variation		434,979,195	8.89%	-434,979,195	-8.89%	-814,760,666	-16.66%
Direct employment	14,465	15,452		13,478		12,617	
-Variation		987	6.82%	-987	-6.82%	-1,849	-12.78%
Indirect employment	365,113	396,296		333,931		306,705	
-Variation		31,182	8.54%	-31,182	-8.54%	-58,408	-16.00%
Profits (€)	-						
-Variation	-	105,490,331		-105,490,331		-197,594,214	
Excise tax (€)	5,094,655,217	4,438,141,871		5,569,959,714		5,836,773,859	
-Variation		-656,513,346	-12.89%	475,304,497	9.33%	742,118,642	14.57%
VAT (€)	3,080,247,261	3,117,711,297		2,981,294,355		2,844,618,535	
-Variation		37,464,036	1.22%	-98,952,906	-3.21%	-235,628,727	-7.65%
Corporate income (€)	-						
- Variation	-	29,537,293		-29,537,293		-55,326,380	
Personal income & SS (€)	4,740,209,511	5,140,586,206		4,339,832,816		3,990,262,878	
-Variation		400,376,695	8.45%	-400,376,695	-8.45%	-749,946,633	-15.82%
Government revenue (€)							
- Variation		-189,135,322	-1.45%	-53,562,397	-0.41%	-298,783,098	-2.29%
Unemployment benefit (€)	-			-103,908,227		-194,630,772	
Net increase year 1 (€)	-			-157,470,624		-493,413,870	

NOTES: Current levels of the excise tax in EURO per litre have been calculated for the different countries assuming a standard of 5% alcohol by volume or 12.5 Plato degree (see Appendix I for details). They are shown for illustration purposes only. The average excise tax collected per litre of beer can differ from this figure, since the average alcohol content of beer does not have to be exactly equal to 12.5 Plato degree in the seven countries under analysis. In our estimates of impact on Government revenues, we considered the actual average tax rate (not that shown in the Table). Consumption, price and employment levels in our base case scenario (current level) are for year 2008, have been provided by The Brewers of Europe, and are based on estimates from Ernst & Young. In those cases in which the excise tax rate has been modified after 2008, prices, volumes and employment levels have been adjusted accordingly with estimated levels of pass-through and elasticities. In the UK, there was also a variation in the VAT rate, which was reduced from 17.5% to 15.0%. 2008 price levels were also adjusted accordingly.
Source: PwC analysis.

The country Tables show that a 20% increase in beer excise taxes is to a great extent, if not totally, offset by a fall in other sources of revenues, as beer sales and employment fall accordingly.

According to our calculations, a rise of 20% in excise taxes would lead to an increase in overall beer-related tax revenues for the Government of only 0.33% in Germany (some EURO 41.8 million), 0.48% in Spain (EURO 16.9 million), 0.75% in France (EURO 19.8 million), 2.09% in Poland (EURO 66.2 million), 2.12% in Czech Republic (EURO 14.8 million), and 3.84% in Finland (EURO 46.7 million).

In the UK, the increase in excise tax revenues would be more than offset by the drop in revenues from income taxes and VAT. As a result, an increase of 20% in the tax rate would lead to a decrease of 0.41% in total Government revenues (some EURO 53.6 million).

If we consider the cost for the Government of the unemployment benefits associated to this loss of jobs, then an increase by 20% in excise taxes leads to an immediate reduction in Government revenues not only in the UK, but also in France and Spain. In Germany and the Czech Republic, the net benefit for the Government budget in the first year would amount to less than EURO 10 million (4.6 million in Germany and 9.7 million in the Czech Republic). In the case of Finland, we have not taken into account in our estimates the possible effect of a excise tax increase on so-called 'passenger imports' from lower price countries, which in 2007 accounted for about 12.52% of total alcohol consumption in this market.[22] According to our calculations, the net immediate impact on the budget of the Finnish Government of a 20% tax rise would also be negative if the weight of passenger imports over total consumption increases by 5.0 percentage points or more.

[22] Lower scale imports, in some cases made by final consumers themselves, from countries located next to Finland where the price of alcoholic drinks in substantially lower. According to the Finnish National Research Center for Welfare and Health (STAKES), passenger imports accounted for 12.52% of total alcohol consumed in Finland in 2007. See STAKES (2008), p. 43.

These findings highlight the importance of considering the wider consequences of beer excise tax changes on the European economy and on overall tax revenues. The structure of the industry, its links with the on-trade sector and the wider economy, and how excise changes ultimately impact on demand, mean that changes to excise rates will have an effect well beyond the change in total excise revenue.

Appendix

PRICEWATERHOUSECOOPERS

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Appendix A. Econometric model of pass-through

For assessing the level of pass through, we have specified a model where the price of beer is a function of input prices and excise levels. In particular, we have estimated the following equation:

$$\Delta \ln(net\_price_t) = \beta_0 + \beta_1 \cdot \Delta \ln(p\_materials_t) + \beta_2 \cdot \Delta \ln(wages_t) + \beta_3 \cdot \Delta excise_t + \varepsilon_t$$

where:

net_price_t is the nominal net price of beer in period t. It is defined as the selling price to final consumers minus the excise on beer.

$p\_materials_t$ is an index of the price of raw materials.

$wages_t$ is an index of the level of wages.

$excise_t$ is the level of the excise tax rate.

ε_t is the error term of the regression.

$ln(.)$ is the natural logarithm function.

Δ is the seasonal lag operator ($\Delta X_t = X_t - X_{t-i}$). Note that the transformation used in the model is equivalent to interannual percent variations, since ($\Delta ln(X_t) \approx [X_t - X_{t-i}]/ X_{t-i}$).

β_k (for k = 1, 2, …) are the parameters to be estimated.

The precise specification of the model used to estimate the level of pass-through in the different countries and distribution channels (on-trade and off-trade) may differ from this general form depending on the information available (see Appendix G).

Econometric estimates have been obtained with STATA. This software tool is standard in econometric analysis. The method of estimation has been OLS. In those cases in which we have found autocorrelation, the error term of the regression has been simultaneously modelled with time-series (ARIMA) techniques, in order to obtain white noise residuals.

Appendix B. Econometric model of elasticities

On-trade

In order to estimate own- and cross-price elasticities of the demand of beer in the on-trade channel, we have used the following equation:

$$\Delta \ln(q\_beer\_on_t) = \beta_0 + \beta_1 \cdot \Delta \ln(p\_beer\_on_t) + \beta_2 \cdot \Delta \ln(p\_beer\_off_t) + \beta_3 \cdot \Delta \ln(p\_spirits\_on_t) + \beta_4 \cdot \Delta \ln(p\_wine\_on_t) + \beta_5 \cdot \Delta \ln(p\_soft\_on_t) + \beta_6 \cdot \Delta \ln(gdp_t) + \varepsilon_t$$

where:

$q\_beer\_on_t$ is the consumption of beer in the on-trade channel in period t.

$p\_beer\_on_t$, $p\_spirits\_on_t$, $p\_wine\_on_t$ and $p\_soft\_on_t$ are real prices of, respectively, beer, spirits, wine and soft drinks in the on-trade channel. These prices are selling prices to the final consumer and, in those cases in which the original data was on nominal terms, have been deflated by using the consumer price index (CPI).

$p\_beer\_off_t$ is the real price of beer in the off-trade channel.

gdp_t is the real gross domestic product (GDP) in period *t*.

ln(.) and Δ are defined as in Appendix A.

ε_t is the error term of the regression.

β_k (for k = 1, 2, …) are the elasticities to be estimated.

Off-trade

The estimating equation for off-trade beer is the following

$$\Delta \ln(q\_beer\_off_t) = \beta_0 + \beta_1 \cdot \Delta \ln(p\_beer\_off_t) + \beta_2 \cdot \Delta \ln(p\_beer\_on_t) + \beta_3 \cdot \Delta \ln(p\_spirits\_off_t) + \beta_4 \cdot \Delta \ln(p\_wine\_off_t) + \beta_5 \cdot \Delta \ln(p\_soft\_off_t) + \beta_6 \cdot \Delta \ln(gdp_t) + \varepsilon_t$$

where:

$q\_beer\_off_t$ is the consumption of beer in the off-trade channel in period t.

$p\_beer\_off_t$, $p\_spirits\_off_t$, $p\_wine\_off_t$ and $p\_soft\_off_t$ are real prices of, respectively, beer, spirits, wine and soft drinks in the off-trade channel.

$p\_beer\_on_t$ is the real price of beer in the on-trade channel.

gdp_t is the real GDP in period *t*.

ln(.) and Δ are defined as in Appendix A.

ε_t is the error term of the regression.

β_k (for k = 1, 2, …) are the elasticities to be estimated.

The specification of the model used to estimate elasticities in the different countries and channels may differ from this general forms depending on the information available (see Appendix H).

Econometric estimates have been obtained with STATA, a software tool that is standard in econometric analysis.

The method of estimation has been in first instance OLS. We checked for endogeneity in the results of OLS estimates by using the Durwin-Wu-Hausman test. In those cases in which evidence of endogeneity was found, we used the instrumental variables (two stage least squares or 2SLS) estimator. In the presence of autocorrelation, the error term has been modelled with ARIMA techniques, in order to obtain white noise residuals.

Appendix C. Relationship between employment and consumption

Table C-1 Results of regression: logarithm of direct employment v. consumption

dependent variable: log(direct employment)	estimated coefficients (p-value)
Constant	3.0249661 (0.0001)
log(consumption)	0.7673827 (0.0000)
# observations	19
R-squared	0.8393

Source: PwC estimates.

Table C-2 Results of regression: logarithm of indirect employment v. consumption

dependent variable: log(indirect employment)	estimated coefficients (p-value)
Constant	4.2978690 (0.0000)
log(consumption)	0.9604581 (0.0000)
# observations	19
R-squared	0.8427

Source: PwC estimates.

Appendix D. Analysis of impact on profitability

Our analysis of the impact on profitability is very much based on the results of the study undertaken by PwC for The Brewers of Europe into the cost of production of a number of alcoholic beverages, including beer. In particular, we have taken from the study estimates on total net revenues, operating margins, amortization and labour costs (as a percentage of net sales) for the beer industry in each one of the seven countries considered in our analysis. Most of them are year 2007 estimates.

From these estimates, we have calculated the average profit lost per litre of beer not sold.

Operating margin is the difference between revenue and total operating costs, including variable and fixed (non-avoidable) costs. The average loss of profit, as a percentage of net sales, is therefore calculated as the sum of the operating margin (revenue - variable costs - fixed costs) plus fixed costs.

We have considered that fixed costs comprise 100% of amortization costs and 23.3% of labour costs. The percentage of labour costs regarded fixed is based on the results of the regression analysis detailed in subsection 2.4.1 above, which showed that a decrease of 1% in consumption would lead to a reduction of 0.767% in employment. This means that 23.3% of labour costs (1 minus 0.767) do not vary with consumption and are fixed.

The profit loss per litre of beer not sold is calculated as the net revenue per litre of beer (ratio between net sales in EURO, and total consumption) multiplied by the percentage resulting from the sum of operating margin and fixed costs.

The impact on total industry profits has been estimated, for each of the countries covered in our study, as the product between the total variation in consumption and the profit loss per litre of beer not sold.

Appendix E. Impact on Government revenues

Table E-1 Analysis of impact on Government revenues: main assumptions

Country	VAT rate	Corporate income rate	Personal income and SS (EURO).	
			direct empl.	indirect empl.
Czech R.	19.0%	20.0%	6,361	5,541
Finland	22.0%	26.0%	21,857	18,391
France	19.6%	34.4%	32,654	16,094
Germany	19.0%	29.8%	21,335	15,175
Poland	22.0%	19.0%	22,933	4,169
Spain	7.0% / 16.0% (*)	30.0%	20,158	9,205
UK	15.0%	28.0%	17,961	12,271

NOTES: (*) VAT rate of 7.0% applicable to sales of beer made in the on-trade channel. VAT rate of 16.0% applicable to sales of beer in the off-trade channel.
Source: European Commission (VAT and corporate income rate), and The Brewers of Europe (based on estimates from Ernst & Young, personal income tax and social security contributions).

Table E-2 Calculation of the cost of unemployment benefits: main assumptions

Country	Average duration of unemployment (months) (1)	Average unemployment benefit (EURO/month)
Czech R.	21.9	201.08 (2)
Finland	10.1	1,948.77 (3)
France	13.8	1,623.12 (4)
Germany	12.0	2,138.10 (5)
Poland	16.5	160.72 (6)
Spain	11.6	1,001.70 (7)
UK	9.2	349.92

NOTES: (1) Average duration of unemployment along the period between 2005 and 2008. Figures for Czech Republic, Finland, France, Poland and Spain were obtained directly from the OECD. For Germany, we assumed an average duration of unemployment of 12 months since, depending on their particular situation, jobseekers in this country receive the unemployment benefit for a period of between 6 and 18 months. The unemployment benefit for the UK was estimated from data provided by the OCDE on number of jobseekers by duration of unemployment (less than 1 month, between 1 and 3 months, etc.). From these data, we can only obtain a rough figure that underestimates the real duration of unemployment in the UK; (2) The unemployment benefit in the Czech Republic has been estimated with data from the Czech Statistical Office on total expenditure in unemployment social protection (CZK 18,559 million) and jobseekers for year 2006. We have excluded from the total number of jobseekers those whose economic status prior to seeking employment was retirement, maternity or parental leave or education or training (only 10% of these excluded). The resulting number of jobseekers receiving unemployment subsidies in 2006 is 336,900 people. The unemployment benefit for 2008 has been estimated by applying the inflation rate for years 2007 and 2008 (2.8% and 6.3% respectively) to the unemployment benefit calculated for 2006. Original figures in national currency have been converted into EURO by using a 24.946 CZK/EURO exchange rate; (3) The unemployment benefit in Finland has been calculated from data on total benefits (EURO 2,206.4 million) and recipients (94,350) in 2008 provided by The Social Insurance Institution of Finland (KELA); (4) In France, jobseekers receive 75% of their gross salary (EURO 25,070 per capita and year in 2008, according to Eurostat); (5) According to The Office of Retirement and Disability Office, the unemployment benefit in Germany amounts to 60% of net earnings (people without children). Noncontributory unemployment benefit amounts to EURO 347 per month. In our calculations, we have assumed an average 2008 gross salary of EURO 35,822 per year (source: Eurostat); (6) The unemployment benefit in Poland amounts to PLN 575 per month, and is perceived for a maximum of 12 months, according to the Polish Ministry for Labour and Social Policy. The Government also pays the contribution to the Social Security (25.52% of this amount) for the whole of the period of unemployment. The figure in the Table is a monthly average assuming a duration of unemployment of 16.52 months. Original figures in PLN were converted into EURO by using a 3.5125 PLN/EURO exchange rate; (7) Average unemployment benefit in August 2009 according to the Spanish Ministerio de Trabajo e Inmigración; (8) We have assumed an unemployment allowance of GBP 64.30 per week (15% of average weekly salary). Additional subsidies from tax or mortgage interest reliefs, or housing benefits have not been considered in the analysis. Original figures in national currency have been converted into EURO by using a 0.79628 GBP/EURO exchange rate.
Source: OECD, Czech Statistical Office, KELA, The Office of Retirement and Disability Policy, Ministry of Labour and Social Policy, Ministerio de Trabajo e Inmigración and Eurostat.

Appendix F. Selection of countries: methodology

Initial set of countries

We have considered an initial set comprising the following 20 EU countries:

Table F-1 Initial set of countries considered in the cluster analysis

▪ Austria	▪ Greece	▪ Romania
▪ Belgium	▪ Hungary	▪ Slovakia
▪ Czech Republic	▪ Ireland	▪ Slovenia
▪ Denmark	▪ Italy	▪ Spain
▪ Finland	▪ Netherlands	▪ Sweden
▪ France	▪ Poland	▪ UK
▪ Germany	▪ Portugal	

Source: Datamonitor.

These are the EU countries for which Datamonitor provides information on sales of beer (in volume and value). For most of these countries, Datamonitor also provides data on sales of other three drink categories considered relevant in our study, in particular of wine, spirits and soft drinks.

No comparable information has been found for the remaining seven EU Member States (Bulgaria, Cyprus, Estonia, Latvia, Lithuania, Luxembourg and Malta). According to the information provided by The Brewers of Europe (based on estimates from Ernst & Young) these seven countries represent 3.0% of total beer consumption in the EU.

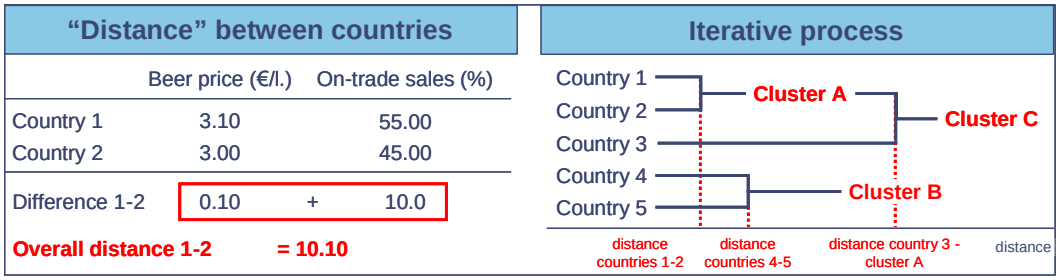
Introduction to cluster analysis

Cluster analysis is a standard statistical technique that objectively groups individual observations (countries) into clusters that can be regarded homogeneous according to a number of characteristics or variables.

The "distance" between observations is calculated by averaging their differences in terms of each one of the characteristics or variables.

In an iterative process, the cluster analysis groups together the observations that are closest (or differ less), as illustrated below.[23]

Figure F-1 Illustration of the iterative process for the definition of clusters



Source: PwC analysis.

List of variables considered

We have considered a basic set with the following variables:

[23] For illustration purposes only. In our analysis, distance between countries has been measured in terms of the normalized Euclidean distance. Distance with respect to a particular cluster has been measured with respect to the cluster average.

Figure F-2 Variables considered in the cluster analysis

Variable	Source	Variable	Source
1. CAGR of beer sales (in volume) between 2002 and 2007 (*) 2. Ratio between the average price of beer and the average price of wine in 2007 (*) 3. Ratio between the average price of beer and the average price of spirits in 2007 (*) 4. Ratio between the average price of beer and the average price of carbonated soft drinks (CSD) in 2007 (*) 5. Ratio between volume sales of beer and volume sales of wine in 2007 (*) 6. Ratio between volume sales of beer and volume sales of spirits in 2007 (*) 7. Ratio between volume sales of beer and volume sales of CSD in 2007 (*) 8. Ratio between volume sales of standard (low price) beer and total volume of beer sold in 2007 (*)	Datamonitor	9. Percentage of beer volume sales made on-trade in 2007 (*) 10. Percentage of per-capita income spent on beer in 2007 (*) 11. Ratio between beer excise taxes (euros per litre of beer) and the average price of beer in 2007 (*) 12. Ratio between beer excise taxes and wine excise taxes (in euros per litre of, respectively, beer and wine) in 2007 (*) 13. Ratio between beer excise taxes and spirits excise taxes in 2007 (*) 14. C3 concentration ratio calculated as the sum of the market shares of the three largest beer producers in 2007 (*) 15. Value added tax (VAT) 16. Price of diesel fuel 17. Compensation per employee	Datamonitor Eurostat European Commission

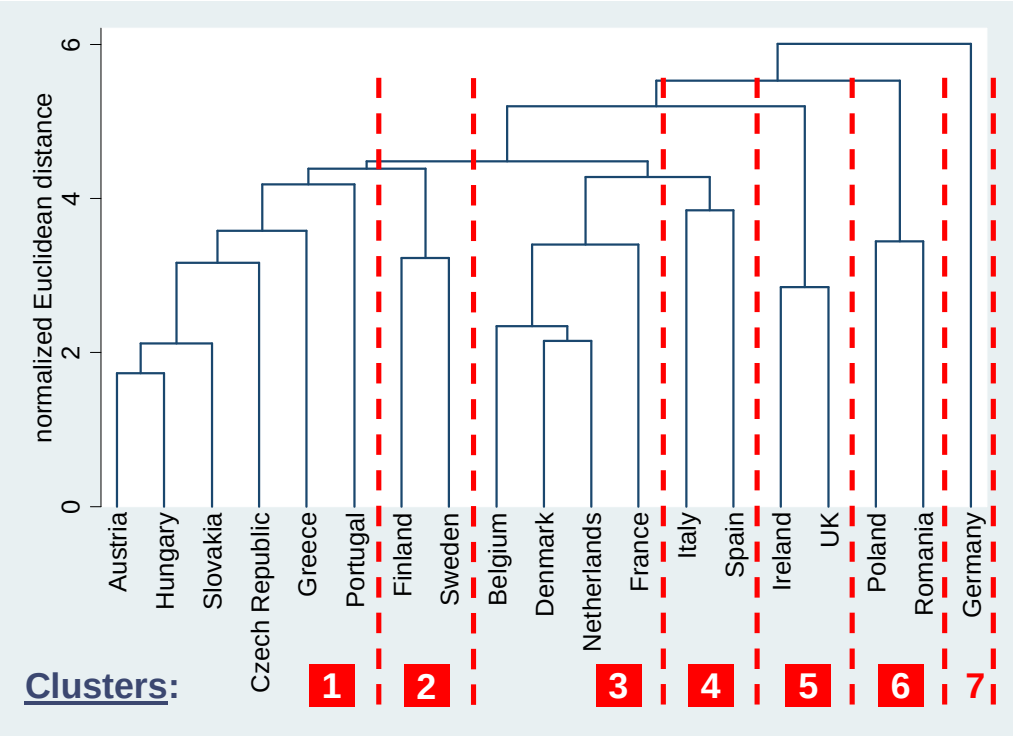
NOTE: Variables within the basic set considered in the cluster analysis are marked with an asterisk.
Source: PwC analysis.

Resulting clusters

Data has been processed using STATA. This software tool is standard in statistics and econometrics, and includes specific commands for cluster analysis.

The results of the cluster analysis with the basic set of variables are presented in the chart (dendrogram) below.

Figure F-3 Results of the cluster analysis: dendrogram



Source: PwC analysis.

The sample for the study comprises the following seven countries: Czech Republic, Finland, France, Germany, Poland, Spain and the UK.

The countries listed above represent more than 70% of total beer sold in the initial set of 20 EU countries considered (source:Datamonitor).

The country selected as representative from each cluster has almost consistently been that with the higher volume of beer sold.

The only exception is Finland. Beer consumption in this country is only slightly lower than in the other country within its cluster, Sweden. It was included in the sample according to its specific characteristics in terms of location, excise taxes and availability of information.

We have conducted sensitivity analyses to check the robustness of the results of the cluster analysis to variations in the set of variables considered. The results are very robust in that the Czech Republic, Germany, Poland, Spain and the UK have to be included in the sample of countries for the study.

Appendix G. Estimated levels of pass-through

UK results

The pass-through models for the on-trade and off-trade channels have been estimated with monthly data from January 2005 to March 2009.

Data on prices have been provided by Nielsen. Data on excise tax rates are from the British Government (HM Revenue and Customs).

The source of the indexes used as proxies for production costs is the UK Office for National Statistics. In particular, we have used the following cost indexes to estimate the level of pass-through in the on-trade channel:

- *p_materials* is an index of prices of raw materials and fuels purchased in the food, beverages and tobacco industry in the UK.
- *w_beverages* is an index of the evolution of wages in the food, beverages and tobacco industry in the UK.
- *w_horeca* is an index of the evolution of wages in the hospitality sector in the UK.

The model includes five variables to model the changes introduced in the beer excise tax level along the period considered in the analysis. These changes occurred on 20 March 2005 (from 50.36 £/Hl to 51.68 £/Hl), 26 March 2006 (53.04 £/Hl), 26 March 2007 (54.84 £/Hl), 17 March 2008 (59.84 £/Hl) and 1 December 2008 (64.60 £/Hl).[24]

In order to account for the impact of these changes on final prices, we have defined the dummies variables $d\_exciseJ_t$ (for J = 1, 2, 3, 4, 5), which take the value 1 in the periods after the introduction of the Jth change in the excise level (and 0 in the periods before the change). In the precise month where the Jth change was made, the variable $d\_exciseJ_t$ takes a value which is equal to the percentage of days within the month in which the new tax rate was effectively applied.

The results of the regression for the on-trade channel are included in Table G-1.

The estimated coefficients for input price indexes have all the expected sign (positive), although only the wages in the food, beverage and tobacco industry has been found statistically significant at the 15% confidence level (p-value lower than 0.15). This can be due to the high level of aggregation of these indexes, obtained from public sources.

The first three changes in excise taxes had a positive and statistically significant impact on net prices (the coefficients are positive, and their p-values are lower than 0.10).[25] This means that these tax changes were more than passed-through into on-trade prices. The fourth and fifth excise tax changes, occurred in 2008 (when economic conditions started to deteriorate) had, respectively, a null and negative and significant impact on net prices. This means that the fourth tax change was fully passed-through into prices, whereas the fifth was passed-through only in part.

[24] 4% alcohol by volume.

[25] The p-value reported in the Table indicates whether the estimated coefficients can be regarded statistically different from zero at a certain confidence level. A p-value lower than 0.01 indicates that the coefficient is statistically significant at the 1% confidence level, a p-value lower than 0.05 indicates that it is significant at the 5% level, and so on. The standard confidence levels are 1%, 5% and 10%. A p-value higher than 0.10 indicates that the coefficient is not statistically different from 0.

Table G-1 Pass-through equation for on-trade beer in the UK

dependent variable: Δ_{12}ln(net_price_on)	estimated coefficients (p-value)
Constant	0.0154209 (0.092)
Δ_{12}ln(p_materials)	0.0528591 (0.322)
Δ_{12}ln(w_beverages)	0.324727 (0.106)
Δ_{12}ln(w_horeca)	0.0395023 (0.462)
Δ_{12}d_excise1	0.0254151 (0.008)
Δ_{12}d_excise2	0.0208944 (0.013)
Δ_{12}d_excise3	0.0197697 (0.017)
Δ_{12}d_excise4	0.013244 (0.157)
Δ_{12}d_excise5	-0.0194403 (0.000)
# observations	38

Source: PwC estimates.

The estimated parameters for the excise changes imply an average elasticity of 0.42035, according to the calculations included in Table G-2. This means that a 1% increase in the excise level makes the net price increase by 0.42035%

Table G-2 Elasticity of net price to excise in the on-trade channel in the UK

Changes in excise	Date	Former excise (£/Hl)	New excise (£/Hl)	%Δ Excise	Estimated parameter	Implied elasticity
d_excise1	20/03/2005	50.36	51.68	2.62%	0.0254151	0.96962
d_excise2	26/03/2006	51.68	53.04	2.63%	0.0208944	0.79399
d_excise3	26/03/2007	53.04	54.84	3.39%	0.0197697	0.58255
d_excise4	17/03/2008	54.84	59.84	9.12%	not significant	0.00000
d_excise5	01/12/2008	59.84	64.60	7.95%	-0.0194403	-0.24439
					AVERAGE ELASTICITY	**0.42035**

Source: PwC estimates.

The result of the estimation for the off-trade channel is included in Table G-3.

Table G-3 Pass-through equation for off-trade beer in the UK

dependent variable: Δ_{12}ln(net_price_off)	estimated coefficients (p-value)
Constant	0.0388311 (0.280)
Δ_{12}d_excise1	-0.0494082 (0.679)
Δ_{12}d_excise2	-0.055087 (0.142)
Δ_{12}d_excise3	-0.0733316 (0.035)
Δ_{12}d_excise4	-0.0496844 (0.150)
Δ_{12}d_excise5	0.0553964 (0.008)
# observations	38

Source: PwC estimates.

The estimated parameters imply an overall elasticity of -0.29289, as shown in Table G-4.

Table G-4 Elasticity of net price to excise in the off-trade channel in the UK

Changes in excise	Date	Former excise (£/Hl)	New excise (£/Hl)	%Δ Excise	Estimated parameter	Implied elasticity
d_excise1	20/03/2005	50.36	51.68	2.62%	not significant	0.00000
d_excise2	26/03/2006	51.68	53.04	2.63%	not significant	0.00000
d_excise3	26/03/2007	53.04	54.84	3.39%	-0.0733316	-2.16084
d_excise4	17/03/2008	54.84	59.84	9.12%	not significant	0.00000
d_excise5	01/12/2008	59.84	64.60	7.95%	0.0553964	0.69641
					AVERAGE ELASTICITY	**-0.29289**

Source: PwC estimates.

Spain results

Pass-through models for the on-trade and off-trade channels have been estimated with bi-monthly data from December 1998 to March 2009.

Data on prices has been provided by Nielsen. Data on evolution of excise tax rates has been provided by The Brewers of Europe.

Excise tax changes have been modelled, as in the UK, with dummy variables which take the value 0 before the tax variation, and 0 afterwards.

Table G-5 shows the results of the regression for the on-trade channel. The impact on net on-trade prices of the tax changes occurred along the period considered in the regression is found to be positive and statistically significant.

Table G-5 Pass-through equation for on-trade beer in Spain

dependent variable: ln(net_price_on)	estimated coefficients (p-value)
Constant	1.309632 (0.000)
d_excise1	0.008012 (0.058)
d_excise2	0.0111837 (0.000)
# observations	61

NOTES: In this regression, we included a dummy variable to account for a significant increase in prices occurred in October 2004. This variable takes value 0 before October 2004, and 1 afterwards. We also included seasonal dummy variables in the regression. The estimated coefficients for these variables were not statistically significant.
Source: PwC estimates.

Table G-6 shows the calculation of the implied elasticity for the on-trade channel.

Table G-6 Elasticity of net price to excise in the on-trade channel in Spain

Changes in excise	Date	Former excise (€/Hl)	New excise (€/Hl)	%Δ Excise	Estimated parameter	Implied elasticity
d_excise1	01/01/2002	8.38	8.87	5.85%	0.008012	0.13702
d_excise2	16/09/2005	8.87	9.96	12.29%	0.0111837	0.09101
					AVERAGE ELASTICITY	**0.11402**

Source: PwC estimates.

The impact of excise tax changes on net off-trade prices was not found to be statistically significant at any confidence level. The pass-through elasticity used for the analysis of impact in the off-trade channel is therefore equal to zero.

Poland results

In the case of Poland, data on prices is only available for the off-trade channel.

The pass-through model for the off-trade channel has been estimated with monthly data from January 2000 to March 2009.

Data on prices has been provided by Nielsen. The following cost variables were included in the regressions:

- *p_barley* is the price of barley (Canadian No. 1 Western barley) in international commodity markets according to the International Monetary Fund.

- *wages* is the evolution of earnings per month in non-agricultural activities in Poland according to the International Labour Organization.

There has been only one tax change along the period for which data on prices and the remaining variables are available (in March 2009, when the excise tax rate was increased from PLN 6.86 to 7.79 per Plato degree). The impact of this tax change on net prices is not found to be statistically significant. We have therefore assumed a pass-through elasticity of zero for the analysis of impact.

It should be noted, however, that we only have data for one month (March 2009) to evaluate the impact of the tax change on prices.

France results

Data on prices was only available for the off-trade channel.

The pass-through model for the off-trade channel has been estimated with monthly data from January 2005 to March 2009.

Data on prices are from the INSEE (the French Statistical Office), and refer to the price of a pack of 6 cans of 33 cl. The following cost variables were considered in the regression:

- *p_barley* (same as above).
- *wages* is an index of the evolution of monthly earnings in the food, beverages and tobacco sector in France elaborated by the INSEE.

Excise tax changes have been modelled with dummy variables.

The results of the regression are shown in Table G-7 below.

Table G-7 Pass-through equation for off-trade beer in France

dependent variable: ln(net_price_off)	estimated coefficients (p-value)
Constant	-2.29078 (0.001)
ln(wages)	0.7024463 (0.000)
ln(p_barley)	0.0090206 (0.348)
d_excise	-0.0037765 (0.388)
# observations	51

NOTES: We included seasonal dummy variables in the regression. The estimated coefficients (not reported in the Table) were significant for some of these variables.
Source: PwC estimates.

Excise taxes only changed once in the period considered in the regression (in January 2009, when the excise rate was increased from EURO 2.56 to 2.58 per percentage point of alcohol by volume). The impact of this change on net off-trade prices is not statistically significant. We have therefore considered a pass-through elasticity of zero for the impact analysis, with the only exception of the unitary taxation scenario, where the pass-through elasticity has been assumed to be negative and equal to -0.01..

Finland results

The pass-through models for the on-trade and off-trade channels in Finland have been estimated with monthly data from January 2005 to December 2008.

Data on prices are from Valvira (the Finnish Health Authority).

The results of the regression for the on-trade channel are shown in Table G-8.

Table G-8 Pass-through equation for on-trade beer in Finland

dependent variable: ln(net_price_on)	estimated coefficients (p-value)
Constant	-0.9043797 (0.066)
excise	0.2157843 (0.036)
# observations	48

NOTES: We included seasonal dummy variables in the regression. The estimated coefficients (not reported in the Table) were significant for most of these variables.
Source: PwC estimates.

The tax changes occurred along the period considered in the analysis had a positive and significant impact on net prices. The estimated pass-through elasticity is 0.2157843.

Appendix H. Estimated demand elasticities

UK results

The on-trade and off-trade models have been estimated with monthly data from February 2005 to December 2008.

Data on volume of beer sold and prices of beer, spirits and wine have been provided by Nielsen, and are split by distribution channel (on-trade and off-trade). In the regressions, we have considered the price of the most popular type of spirit and wine in the UK, i.e., vodka and light wine. Original data on nominal prices have been converted into real prices by using the CPI provided by the Office of National Statistics as deflator.

Data on the price of soft drinks has been taken from the Office for National Statistics and is for the whole of the British market (on-trade plus off-trade).

Data on real GDP are quarterly and have been taken from the Office for National Statistics.

The results of the regression and the estimated elasticities for the on-trade channel are included in Table H-1.

Table H-1 Estimated elasticities for the on-trade beer demand in the UK

dependent variable: Δ_{12}ln(q_beer_on)	estimated coefficients (p-value)
constant	-0.1074669 (0.000)
Δ_{12}ln(p_beer_on)	-1.267037 (0.000)
Δ_{12}ln(p_beer_off)	-0.2086386 (0.359)
Δ_{12}ln(p_vodka_on)	0.6178926 (0.069)
Δ_{12}ln(p_lightwine_on)	0.8636521 (0.000)
Δ_{12}ln(p_soft)	-0.1332371 (0.541)
Δ_{12}ln(gdp)	1.165549 (0.000)
# observations	35

Source: PwC estimates.

The estimated own-price elasticity in the on-trade channel is -1.27. The main substitutes for beer consumed on-trade are light wine and vodka, with cross elasticities of 0.86 and 0.62, respectively. The coefficients of the price of off-trade beer and soft drinks have not been found to be significantly different from zero, which means that they are not close substitutes for on-trade beer.

The results of the regression for the off-trade channel are included in Table H-2. In this case, in order to correct for endogeneity, we have used instrumental variables (2SLS) estimation techniques.[26]

Table H-2 Estimated elasticities for the off-trade beer demand in the UK

dependent variable: Δ_{12}ln(q_beer_off)	**estimated coefficients (p-value)**
constant	0.0146534 (0.641)
Δ_{12}ln(p_beer_off)	-1.146489 (0.000)
Δ_{12}ln(p_beer_on)	0.647338 (0.491)
Δ_{12}ln(p_vodka_off)	-0.9397669 (0.124)
Δ_{12}ln(p_lightwine_off)	0.7892149 (0.414)
Δ_{12}ln(p_soft)	-1.815358 (0.152)
Δ_{12}ln(gdp)	0.2575445 (0.700)
# observations	35

Source: PwC estimates.

The estimated own-price elasticity for off-trade beer is -1.15. The remaining drinks have not been found to be close substitutes for off-trade beer.

Spain results

Demand elasticities have been estimated with bi-monthly data from December 2004 to March 2009. Prior to December 2004, there were data available on beer sales and prices, but not for other drink categories (spirits, vodka and soft drinks).

Data on volume of beer sold and prices of beer, spirits, wine and soft drinks have been provided by Nielsen. Original data on nominal prices have been converted into real prices by using the CPI provided by the Instituto Nacional de Estadística (Spanish Statistics Office) as deflator. Real GDP data are quarterly and have been taken from the Spanish Statistics Office.

The results of the regression for the on-trade channel are reported in Table H-3 below. The elasticity of the demand for beer on-trade with respect to its own price is found to be negative, statistically significant and equal to -0.90.

The price of the remaining drinks considered in the regression has not a significant effect on the consumption of beer on-trade.

[26] Input prices and excise dummy variables have been employed as instruments.

Table H-3 Estimated elasticities for the on-trade beer demand in Spain

dependent variable: ln(q_beer_on)	estimated coefficients (p-value)
constant	7.116279 (0.015)
ln(p_beer_on)	-0.9045412 (0.081)
ln(p_beer_off)	0.2353813 (0.720)
ln(p_still wine_on)	-0.2801977 (0.838)
ln(p_spirits_on)	1.042375 (0.463)
ln(gdp)	0.6353788 (0.034)
# observations	24

NOTES: We included seasonal dummy variables in the regression. The estimated coefficients (not reported in the Table) were significant for some of these variables.
Source: PwC estimates.

The results of the regression for the off-trade channel are shown in Table H-4 below. The estimated elasticity of the demand for off-trade beer with respect to its own price is -0.83. The cross elasticity with respect to the price of whisky is positive and significant, which means that whisky is a viable substitute of beer in this channel. The coefficients for wine and soft drinks are also positive and nearly significant (p-values of around 0.15).

Both the on-trade and off-trade demand equations have been estimated with instrumental variables (2SLS) techniques to correct endogeneity.[27]

[27] Input price indexes (from the Instituto Nacional de Estadística) and excise dummy variables have been employed as instruments.

Table H-4 Estimated elasticities for the off-trade beer demand in Spain

dependent variable: ln(q_beer_off)	estimated coefficients (p-value)
constant	2.513648 (0.036)
ln(p_beer_off)	-0.8346004 (0.096)
ln(p_beer_on)	0.1870708 (0.317)
ln(p_still wine_off)	0.1987898 (0.153)
ln(p_wine wod_off)(1)	-0.0618589 (0.430)
ln(p_spark wine_off)	-0.1035822 (0.438)
ln(p_whisky_off)	0.8096024 (0.007)
ln(p_carbonated soft_off)	0.3573772 (0.146)
ln(gdp)	1.426924 (0.000)
# observations	24

NOTES: (1) Wine wod stands for wine without denomination of origin. We included seasonal dummies in the regression. The coefficients (not reported in the Table) were significant for most of these variables.
Source: PwC estimates.

Poland results

Demand elasticities have been estimated with the data for the off-trade channel from January 2000 to January 2009.

Data on volume of beer sold has been taken from the Central Statistical Office of Poland. Data on off-trade prices have been provided by Nielsen. Nominal prices have been deflated by using the CPI provided by the Central Statistical Office. Data on real GDP are quarterly and have been obtained from Eurostat.

The estimated elasticities are reported in Table H-5 below. The own-price elasticity is negative, statistically significant and equal to -1.49. The estimated coefficient for the price of wine is almost significant at the 10% confidence level, which means that wine could be a substitute for beer in the Polish market.

Table H-5 Estimated elasticities for the off-trade beer demand in Poland

dependent variable: ln(q_beer)	estimated coefficients (p-value)
constant	9.254841 (0.004)
ln(p_beer_off)	-1.490342 (0.004)
ln(p_vodka_on)	-0.0015416 (0.990)
ln(p_wine_on)	0.6741848 (0.103)
ln(gdp)	0.4688499 (0.041)
# observations	109

NOTES: We included seasonal dummy variables in the regression. The estimated coefficients (not reported in the Table) were significant for most of these variables.
Source: PwC estimates.

Germany results

The elasticity of demand has been estimated with data for the total market (on-trade plus off-trade) from the first quarter of 2005 to the first quarter of 2009. These data have been provided by Nielsen and the German Statistics Office (Statistisches Bundesamt). Original data on nominal prices have been deflated by using the CPI provided by this source. Real GDP has been obtained from Eurostat.

The results of the regression are included in Table H-6 below.

Table H-6 Estimated elasticity for the beer demand in Germany

dependent variable: ln(q_beer)	estimated coefficients (p-value)
constant	-13.1289 (0.000)
ln(p_beer)	-0.5679822 (0.000)
ln(gdp)	1.225293 (0.000)
# observations	109

NOTES: We included seasonal dummy variables in the regression. The estimated coefficients (not reported in the Table) were significant for all of these variables. We also included a linear trend. The coefficient for this trend was found to be negative and statistically significant.
Source: PwC estimates.

France results

The elasticity of demand has been estimated with monthly data for the off-trade channel from January 2005 to March 2009.

Data on volume of beer sold have been provided by the French Brewers Association (Brasseurs de France). Data on off-trade prices have been taken from the French Statistics Office (INSEE). Real GDP data have also been obtained from INSEE.

The results of the regression are reported in Table H-7 below. The own-price elasticity is found to be negative, statistically significant and equal to -1.35. For the unitary taxation scenario, we have assumed a reduction of 30% with respect to the estimated elasticity.

Table H-7 Estimated elasticity for the off-trade beer demand in France

dependent variable: Δ_{12}ln(q_beer)	**estimated coefficients (p-value)**
constant	-0.0071364 (0.567)
Δ_{12}ln(p_beer_off)	-1.352153 (0.099)
Δ_{12}ln(gdp)	0.6705251 (0.643)
# observations	39

NOTES: We included yearly dummies in the regression. The estimated coefficients (not reported in the Table) were significant for one of these variables.
Source: PwC estimates.

Finland results

Demand elasticities have been estimated with yearly data for the whole market (on-trade plus off-trade) from 1991 to 2007.

Data on volume of beer sold and prices of beer and other drinks have been obtained from Valvira. Data on real GDP and an index of the cost of living (used as deflator to calculate real prices) have been taken from Eurostat and Statistics Finland.

The results of the regression are presented in the Table below. The estimated own-price elasticity of the demand for beer is equal to -0.76. The estimated cross elasticity with respect to the price of vodka is positive and statistically significant, which means that vodka is a substitute for beer in Finland.

Table H-8 Estimated elasticities for the beer demand in Finland

dependent variable: Δln(q_beer)	estimated coefficients (p-value)
constant	0.0002488 (0.567)
Δln(p_beer)	-0.7646451 (0.024)
Δln(p_vodka)	0.2005673 (0.005)
Δln(p_fortified wine)	-0.1271283 (0.716)
Δln(p_other wine)	-0.0459078 (0.894)
Δln(p_cider)	0.0500467 (0.419)
Δln(gdp)	-0.0634532 (0.899)
# observations	17

Source: PwC estimates.

Czech Republic results

The elasticity of demand has been estimated with monthly data for the off-trade channel from July 2006 to March 2009.

Data on volume of beer sold and prices have been provided by market research company IRI. Data on real GDP and CPI (used as a deflator to calculate real prices) have been obtained from Eurostat. The results of the regression are reported in the Table below.

Table H-9 Estimated elasticity for the off-trade beer demand in the Czech Republic

dependent variable: Δ_{12}ln(q_beer_off)	estimated coefficients (p-value)
constant	0.0441981 (0.317)
Δ_{12}ln(p_beer_off)	-1.143961 (0.015)
Δ_{12}ln(gdp)	0.7842367 (0.502)
# observations	21

Source: PwC estimates.

The estimated own-price elasticity of demand is equal to -1.14. Instrumental variables (2SLS) estimation techniques have been used to correct endogeneity.[28]

[28] Input price indexes (from the Czech Statistical Office) have been employed as instruments.

Appendix I. Current level of excise tax rates

Table I-1 Current level of excise tax rates in the countries considered in the study

Country	Current excise tax rate (per hectolitre of beer)	Exchange rate (national currency / EURO)
Czech R.	CZK 24.00 / Plato degree	24.9460 CZK/EURO
Finland	EURO 25.96 / 1% of abv	-
France	EURO 2.64 / 1% of abv	-
Germany	EURO 0.79 / Plato degree	-
Poland	PLN 7.79 / Plato degree	3.5121 PLN/EURO
Spain	EURO 9.96	-
UK	GBP 16.47 / 1% of abv	0.79628 GBP/EURO

NOTE: Exchange rates are 2008 averages.
Source: European Commission, HM Revenue and Customs.

Chapter II

Comparable cost analysis

Index

List of Charts

1 Key findings

PRICEWATERHOUSECOOPERS

1. Key findings

❶ The alcohol beverage sector is a significant industry within the European Union

⇨ The alcoholic beverage sector in the European Union in 2007 was worth **€242.5bn** in terms of sales[1]. Of this number, sales of beer in absolute terms accounts for the highest proportion by value €111.5bn or 46.0%.

❷ However, margins are low

⇨ Spirits was the most profitable drink category achieving an aggregated net margin per litre of finished product of €1.90 across the value chain. Wine achieves €0.63, with beer achieving just €0.35 across the value chain. However, due to the high volumes sold, beer contributes 50% (€13bn) of the total margin achieved across the value chain (€26bn).

❸ Across the value chain most of the margin is enjoyed in the on-trade

o 79% (€20.5bn) of total margins in 2007 were achieved in the on trade. This illustrates the essential contribution of the different alcohol categories to the sustainability of many bars, clubs, hotels and restaurants, with the significant employment this generates. Over half of this margin (€11.0bn) was generated by beer sales.

❹ The alcohol beverage sector generated approximately 4.7m jobs, most of them indirect jobs in the on-trade

⇨ Of the 4.4m indirect jobs generated by the alcoholic beverages sector, approximately half (2.25m jobs) were employed in the on trade mainly in bars, clubs, restaurants and hotels and 80% of which were generated by the beer sector.

❺ Only 10% of the total margin was enjoyed by alcohol producers

⇨ Of the total margin of €2.5bn enjoyed at the manufacturing stage in 2007, approximately 45% (€1.12bn) was achieved by spirit producers. Brewers achieved a margin of approximately €0.97bn, whilst wine producers achieved just €0.42bn.

⇨ However, wine producers received in 2007 direct subsidies totaling €0.51bn[2] (reaching €1.2bn in 2009). No such subsidies were provided to either spirits or beer producers.

❻ Beer is the most expensive form of alcohol to produce: €45.2 per litre of pure alcohol

⇨ The cost of producing a litre of spirits (in terms of finished product) was 3.5 times higher in 2007 than for a litre of wine or beer.

⇨ However when converted to pure alcohol, wine is the cheapest form of alcohol to produce €17.9, similar to spirits (€18.6), and two and a half times less the cost of producing a litre of pure alcohol in beer €45.2.

[1] Sales do not include either VAT or Excise Tax

[2] See details on http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/1654 and http://europa.eu/rapid/pressReleasesAction.do?reference=IP/09/1214&format=HTML&aged=0&language=EN&guiLanguage=en

❼ Adding excise taxes, beer is still the most expensive form of alcohol to produce and deliver to the consumer

- ⇨ Although the average rate of excise tax on spirits was higher than that of beer and wine, the difference was not enough to offset the additional costs of producing and delivering beer to the consumer.
- ⇨ The average retail price (including taxes) of a litre of alcohol in beer is €84 compared to €77 for wine and €65 for spirits.
- ⇨ Any move towards taxing all drinks based solely on alcohol content (unitary taxation) would therefore disadvantage beer further in terms of the cost of the product to the consumer.

❽ The total tax contribution in 2007 of the alcoholic drinks sector was in excess of €158bn

- ⇨ Beer contributed the highest amount, €68.0bn, in taxes to Members States across the European Union, in the form of indirect taxes (excise taxes and VAT) and via direct taxes (Personal Income Tax, Corporate Income Tax and Social Security Contributions). Spirits were next, accounting for €51.4bn.
- ⇨ Wine accounted for the lowest amount (€39.4bn) but benefited from a reduced rate of excise in France and zero rate in 15 EU Member States, whilst beer and spirits were subject to a positive rate of excise in all countries.

2 Study scope & methodology

PRICEWATERHOUSECOOPERS

2. Study scope & methodology

2.1 Objective of the study

The purpose of this study was to undertake a detailed and comprehensive analysis of the comparable costs of alcoholic beverages across the value chain. The objective was for PwC to produce a report of key findings, which could then be used by The Brewers of Europe to further inform the debate around taxation of alcoholic beverages across the European Union.

2.2 Scope of the study

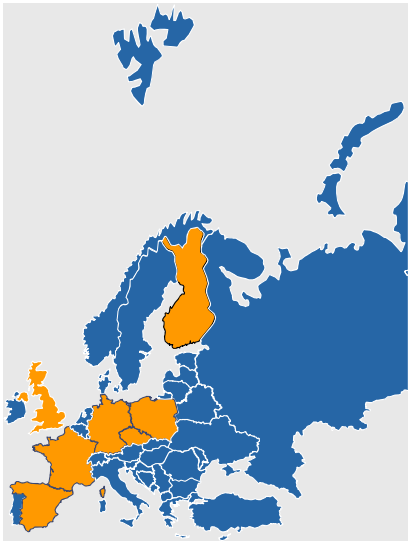
This report analyzes the differences in terms of costs and margins of each of the main parties in the value chain and for each of the main categories of alcoholic beverages (beer, wine and spirits).

PwC has undertaken a comparable cost analysis in a selection of EU countries given their relevance according to a cluster methodology. PwC has applied a mathematical cluster analysis methodology that has resulted in a selection of seven European countries. Detailed individual analyses have been carried out for the following 7 EU Member States:

- Czech Republic,
- Finland,
- France,
- Germany,
- Poland,
- Spain, and
- United Kingdom.

This sample of countries is considered representative of the whole of the EU. An overview of the cluster methodology is provided below. A more detailed explanation and selection of representative countries is included in Appendix F of Chapter I above (on impact of tax changes).

Figure 1: Cluster Countries as a result of our analysis



2.3 Methodology

2.3.1 Sample of countries criteria

PwC's methodology for the selection of the sample of countries for the study is aimed at ensuring that countries are selected attending to criteria of representativeness, so as to facilitate the extrapolation of the results of the study to the whole of the European Union.

Broadly speaking, our methodology comprises two major stages:

- First, the set of countries initially considered as candidates for the sample are divided into 7 clusters of countries regarded as similar or homogeneous
- Second, one representative country is selected from each cluster

Figure 2: Countries selected from each cluster

Country	Total volumes (*)	Country	Total volumes (*)
cluster 1:		cluster 3:	
• Austria	870.70	• France	2,019.10
• Hungary	771.10	• Italy	1,815.30
• Slovakia	368.20	• **Spain**	**3,274.60**
• **Czech Republic**	**1,572.90**	cluster 4:	
• Greece	446.50	• Ireland	548.20
• Portugal	647.30	• **United Kingdom**	**5,903.10**
cluster 2:		cluster 5:	
• Belgium	953.00	• **Germany**	**9,253.40**
• Netherlands	1,297.50	cluster 6:	
• Denmark	427.10	• **Poland**	**3,486.40**
• Sweden	469.50	• Romania	1,954.10
• **Finland**	**450.10**		

(*) Beer in millions of litres

2.3.2 Comparable cost main assumptions

Our analysis has been accomplished following two main director principles:

1. All our cost ratios across different activities in the value chain, for different industries and countries, have been estimated based on publicly available financial statements on different databases.

2. The cost components of the value chain selected for comparison were those that were readily identifiable in the abovementioned reports, in order to undertake a homogeneous comparison between countries and industries.

2.3.3 Bottom-up methodology

We have followed a "bottom-up" methodology as the best option to determine the main figures and conclusions in our study. This has involved an analysis of the publicly available information to understand the costs implied in the manufacturing of the different alcoholic beverages, as well as in the other activities such as supply, distribution and retail sales through on-trade and off-trade channels[3]. This bottom-up methodology has comprised the following steps:

Initial step

As a first approach to fully understand the costs involved across the value chain, we carried out a review of existing literature on the subject in order to analyze the value chain of an alcoholic beverage. Accordingly, we defined and designed the value chain from supply of raw materials to retail sales in order to identify all relevant cost components in each activity.

Figure 3: Complete Value Chain of an alcoholic beverage

[3] On-trade is the general term used to describe on premise sales, i.e. those sales through bars, restaurants, hotels clubs and similar establishments. Off-trade is widely used to describe sales through retail establishments, shops, supermarkets, etc.

This initial picture of the value chain was then shared with the project stakeholders in order to get comments/feedback and take into account any other missing, relevant cost components. As a result of this exercise we established that not all the identified or requested cost components would be readily available through public information databases. This forced us to narrow our analysis to comparison of cost components within the public domain.

Data Collection

The phase of data search and collection to populate our model is best described in two separated categories: by type of information researched and by data source.

Type of information:

The type of information collected comprised Market Information and Financial Information.

For each country included in the study, we obtained the following Market information:

- Volume sales (litres sold) and Value sales (Euro, or other applicable currency) for beer, wine and spirit manufacturers, distributors and retailers.
- Analysis of local market share of each competitor in the alcoholic beverages manufacturing sector in order to take the biggest ones and build up a representative analysis base.
- Market share for distribution companies and retailers in the on-trade and off-trade

Financial Information has been collected through PwC Knowledge Center (searching different databases), by contacting different PwC offices, with assistance of local brewing associations[4] and wider alcoholic beverage sector contacts. The analysis has been focused on the Profit and Loss accounts of the selected companies with the higher market share in their respective markets (beer, wine, spirits, distribution and retailers), and for each country so that we are confident that average costs represent a relevant share in each industry.

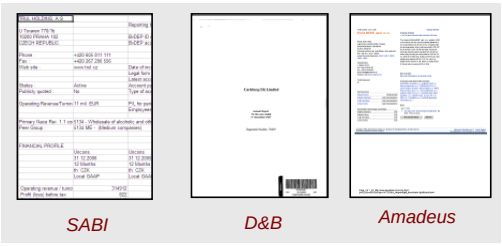
Data sources:

Many different sources of information were searched and ultimately provided data for use in the study. However, a key source of information came from detailed analysis of Profit & Loss statements of companies, available via publicly available financial databases as follows:

1. *Internal data sources:* PricewaterhouseCoopers Knowledge Centres or the PwC Research centre through our extended network of offices in Europe and internal knowledge based on industry expertise in various PwC European teams.

2. *External data sources:* we accessed Nielsen/Datamonitor information regarding beer, wine and spirits, along with distribution and retail markets in each country. Information regarding volume and value was not available via Datamonitor reports. However, any gaps in this area were addressed through use of Nielsen data (Nielsen better audits market information in both on and off trade sales channels).

Figure 4: External providers of Financial Information



[4] National Brewing associations were identified as a credible and cost effective source of information regarding beer and other alcoholic drinks categories for the particular countries being analysed as part of this study.

Figure 5: External Sources

Datamonitor's Reports

From external data sources such as Nielsen or Datamonitor, we usually extracted the following kind of information:

- Market volume and value for each Member State for three analyzed categories of beer, wine and spirits.
- Market share by company in terms of volume and value for each Member State
- Market share by channel (on and off trade routes), including volume and value for each

We have also reviewed several market research documents, working papers and statistical handbooks from other sources –such as Canadean; academic papers from University or Beer/Wine/Spirits local associations - to gain a better insight into local alcoholic beverage activities in each country.

Amadeus and Dun & Bradstreet have been our prime financial information providers, although not all the companies originally selected -for which information was received- have been included in our final model due to incomplete information regarding homogeneous and comparable information.

We also obtained some other annual reports from company websites (where available), downloading full detailed information.

All the data above has been collected for beer, wine and spirits' markets as well as distributors and retailers. A full list of data sources in included at Appendix C.

Validation of information

Finally, once we had analyzed, reviewed and validated the information, it was entered into the comparable cost model[3]. A full list of companies considered for the cost comparable analysis with relevant information available is presented in Appendix A to this report.

From the Profit and Loss statements of representative companies, we analyzed the maximum detail available in the 7 cluster countries and selected a final list of homogeneous comparable costs across different countries considering the differences in reporting:

- ⇨ Total Net Revenues
- ⇨ Packaging and Raw Material supplies
- ⇨ Wages, salaries and other compensations
- ⇨ Amortization and Depreciation
- ⇨ Result from operating activities (EBIT)
- ⇨ Net Income
- ⇨ Number of employees

Comparable cost modeling

The information was then entered into our comparable cost model, full details of which are included at Appendix B. The following represents the main findings of this analysis and modeling exercise.

[3] Companies for which there was no clear information or where information was not well enough broken-down were discarded and the next company in its industry selected as the primary data source.

3 European Union overall results

PRICEWATERHOUSECOOPERS

3. European Union overall results

3.1 Foreword

In this chapter, we share the main findings of our analysis of the value chain according to the output of our comparable cost model. Based on our understanding and know-how of the alcoholic beverages sector we have identified three main activities across the value chain:

- Manufacturing processes
- Distribution and logistics
- Retail sales

The value chain also comprises suppliers to the alcoholic beverages sector, mainly suppliers of agricultural products and packaging. However, since these costs are implied within the manufacturing process, we have not focused our analysis on this part of the value chain, preferring instead to limit our analysis to the above three activities and the companies operating in them.

For the purpose of our analysis, we have had to make a number of assumptions across all drinks categories regarding the comparative cost of distribution and logistics as follows.

1. Distribution and logistics activities in the on-trade are generally not-owned by manufacturers and outsourced to third party specialized service providers[4].
2. Manufacturers transport product for sale in the off-trade and include the cost of distribution and logistics within the price charged to retailers.
3. Transportation from the point of manufacture to distribution/logistics warehouses is arranged by manufacturers, rather than being outsourced.

Our analysis considered the two main routes to market for alcoholic beverages: sales in bars, clubs, hotels and restaurants (on-trade sales) and retail sales in shops, supermarkets, etc (off-trade sales).

The aggregated net margin concept described below is based on our model definition, along with the information we have collected and analyzed as part of this study. This concept is intended to describe the net margins achieved for all the different parties in the value chain and represents the remaining value of products, or services sold after deducting the costs incurred to carry out normal activities, as reflected in the Profit and Loss account

In order to extract main figures and conclusions, we have followed a bottom-up methodology chosen as the best option in terms of public available information to understand the costs implied in the manufacturing of the different alcoholic beverages as well as the other activities of supply, distribution and sales through on and off trade channels.

3.2 The value chain within the alcoholic beverages industry

The alcoholic drinks sector in the European Union is significant worth approximately **€242.5bn**[5] in 2007 with an estimated total net margin of **€26.0bn**.

Of the three main drinks categories beer makes the largest contribution in terms of the absolute value of sales €111.5bn, with a total net margin across the value chain of €13.1bn. Beer is a volume based business where margins in percentage terms are low (0.35€/L. across the value chain).

[4] Reviewing different distribution yearbooks for European countries, it is fact that out of many beverage distribution companies (this is a very fragmented business), very few of them are vertically integrated into alcoholic beverages manufacturing groups

[5] VAT and Excise Tax excluded in sales value

Wine is next in terms of the value of sales (€86.8bn), with a total net margin across the value chain of €7.5bn. Wine margins in percentage terms are again comparatively low and in line with those for beer (0.63€/L. across the value chain).

The value of spirits sales total €43.6bn, with a margin across the value chain worth €5.3bn, the largest in percentage terms of the three alcoholic drink categories (1.90€/L.).

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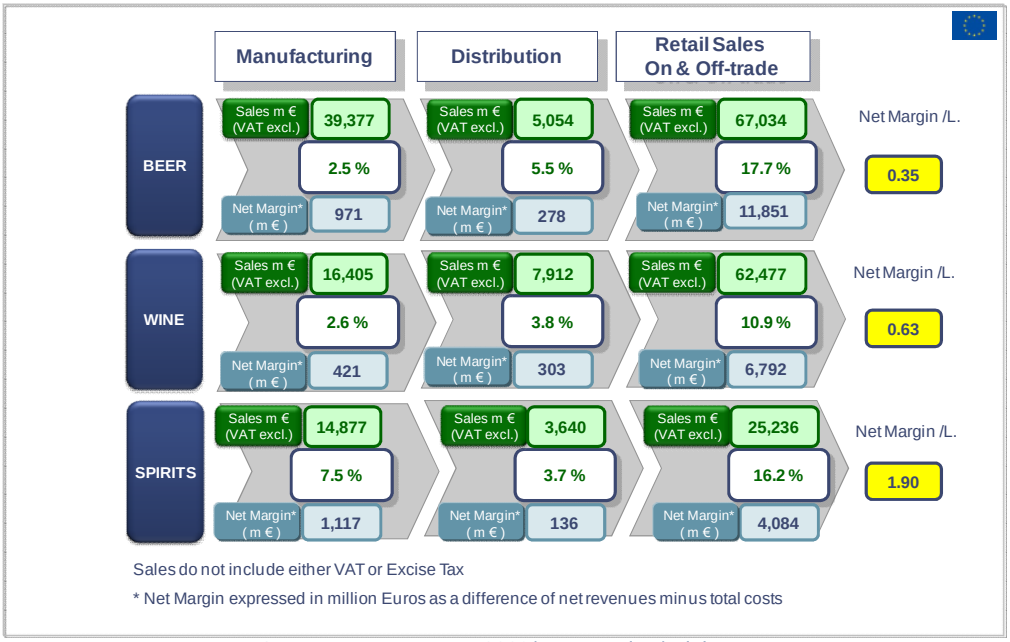
Chart 1 provides a further detailed breakdown by drink category and by activity within the supply chain

Chart 1: Net Margins per activity in the European Union



Source: Ernst & Young 2009/ Datamonitor/ Nielsen

An analysis by activity (Manufacture, Distribution and Retail) shows that for each category of alcoholic beverage the majority of the margin in the value chain is enjoyed in the retail stage: the total retail margin in 2007 is €22.7bn (or 87.3%) of total alcoholic drinks sector margin (€26.0bn). The retail sector is predominantly reliant on beer for this margin: beer contributes approximately 52%, or €11.9bn of the total retail sector margin, with wine and spirit contributing approximately 30% and 18% respectively.

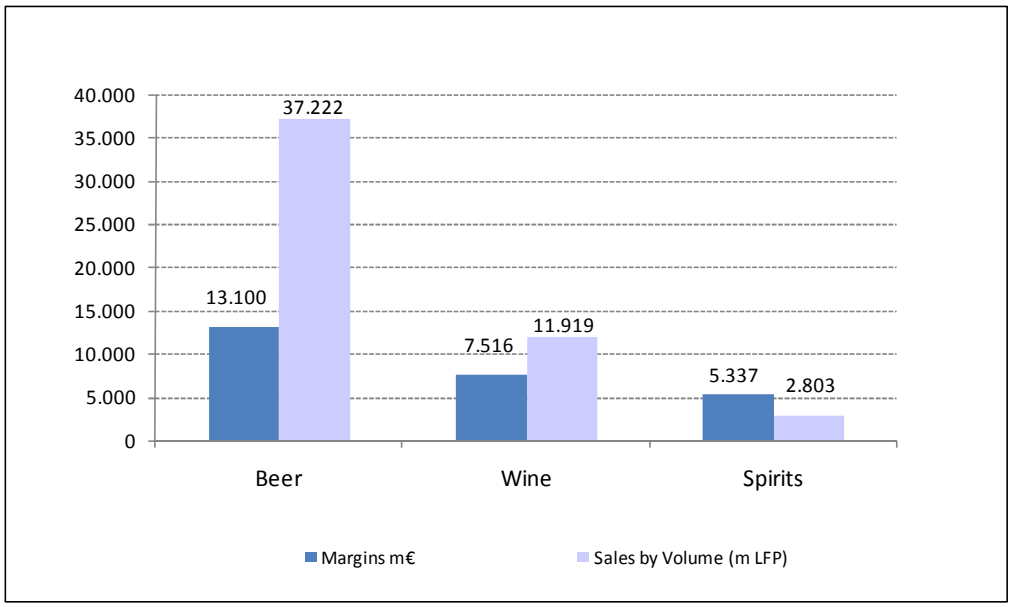
In contrast with this, Distribution is a comparatively low margin activity accounting for only €718m, or 2.8% of total margins across all drinks categories.

The remainder of the margin (approximately, 10% of the total value chain or €2.5bn) is realized at the manufacturing stage.

Despite comparatively smaller total value of sales, manufacturers of spirits have a margin of €1.12bn, or approximately 45% of the total margin enjoyed at the manufacturing stage across the three alcoholic drinks categories. Brewers enjoy a margin of €0.97bn, or approximately 39% of the margin at the manufacturing stage, with wine achieving a margin of just €421m.

However, it is important for the purposes of this study to record that in 2007 wine producers benefited from €0.51bn in direct subsidies across the European Union[6]. No such subsidies are available for either spirits or beer. Wine also benefits from a favorable excise tax regime in 16 countries of the EU. Further explanation of the excise taxation of alcoholic beverages is provided below.

Chart 2: EU Volumes in m's LFP vs. margins in € m



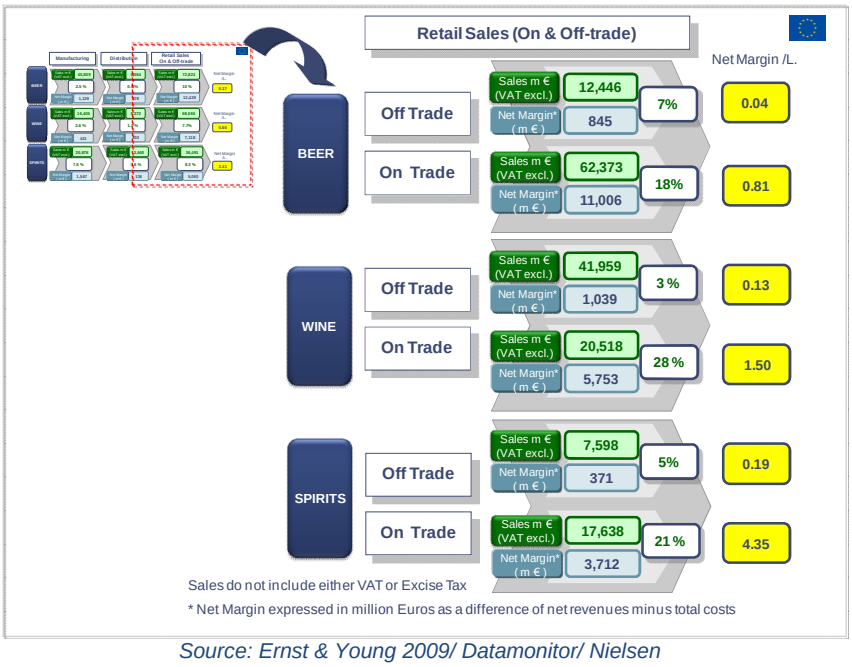
Source: Ernst & Young 2009/ Datamonitor/ Nielsen/ PwC Analysis

This chart further illustrates the above comments, but shows the comparison between the volume in litres of finished product sold by alcoholic beverage and the net margin made for that product (across the whole value chain) in 2007.

Further analysis of the retail stage was undertaken to understand the comparative position for the two routes to market (on and off trade channels). Chart 3 provides a summary of our findings:

[6] 2007 EU wine budget details are available on the following press release http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/1654. In 2009, the EU wine subsidies have reached more than double the amount budgeted for 2007 as stated on this press release http://europa.eu/rapid/pressReleasesAction.do?reference=IP/09/1214&format=HTML&aged=0&language=EN&guiLanguage=en

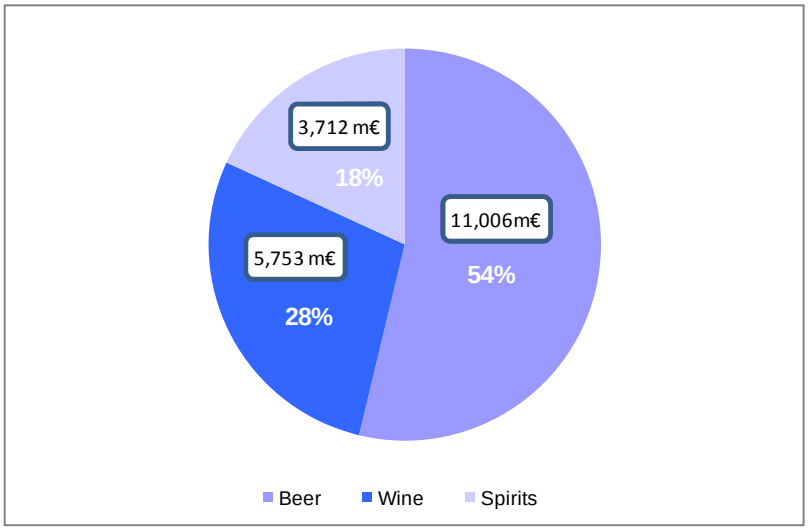
Chart 3: Net Margins in Retail Sales (On-trade & Off-trade) European Union



Source: Ernst & Young 2009/ Datamonitor/ Nielsen

The on-trade channel achieves significantly higher margins than in the off trade. Of the total margin at the retail stage (€22.7bn), 90%, or €20.5bn is captured in the on trade with the remaining 10% achieved by the off trade. It is also relevant to record that of the margin enjoyed in the on trade €11.0bn (53.7%) is contributed by beer, with wine and spirits contributing €5.8bn (28.1%) and €4.4bn (18.2%), respectively (as illustrated in the chart below)

Chart 4: Contribution to the On-Trade



Source: PwC Analysis

This demonstrates the importance of the on trade route to market for all operators in the alcoholic beverage sector. Equally importantly this illustrates the essential contribution of the different alcohol categories to the sustainability of many bars, clubs, hotels and restaurants, with the significant employment this generates. It should be noted that the on-trade sector is made up of a

large proportion of small operators selling small volumes. Therefore higher operating margins are essential to their survival, particularly in the current economic climate and often as many will have business loans to service. In the UK, as sales decline, over 50 pubs a week are currently closing.[7]

Chart 5: 2007 Sales Volumes per drink category on and off trade

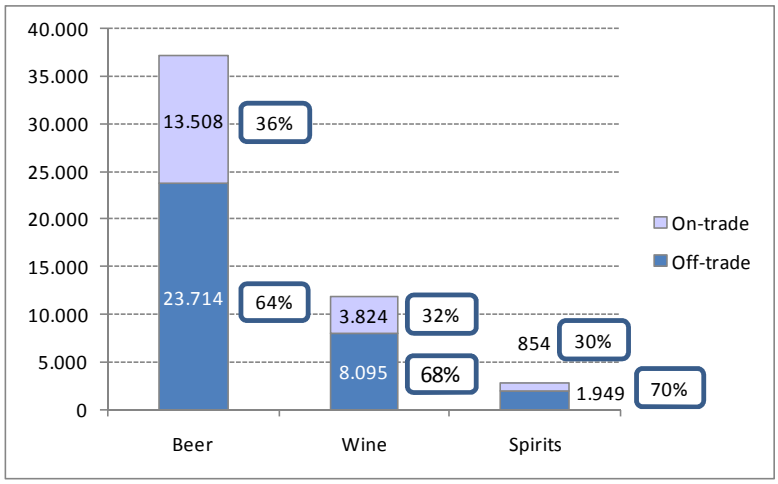
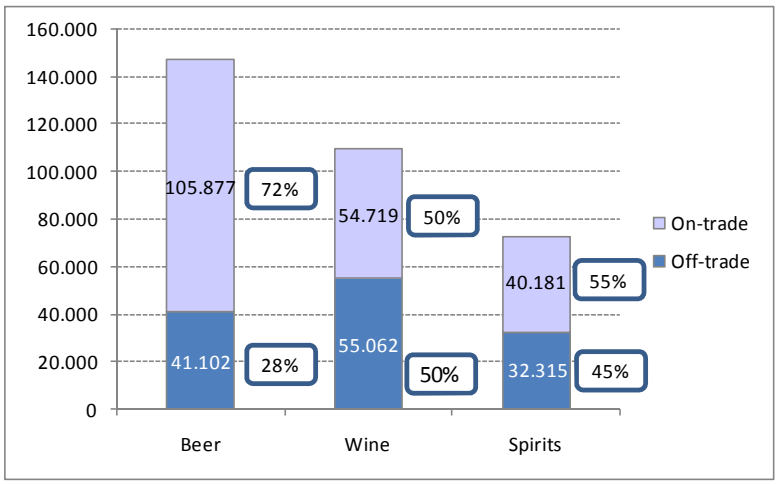


Chart 6: 2007 Sales Values[8] per drink category on and off trade



In Charts 5 and 6, it can be noted that the share of sales by value for each product sold in the on-trade ranges between 72% for beer and 50% for Wine (spirits 55%). However, sales of alcohol by volume via the on-trade are comparatively low 36% for beer, 32% for wine and 30% for spirits. Contrast this with the off trade position where beer sells 64%[9] by volume, which corresponds to just 28% by value; Spirits with 70% by volume for 45% by value and wine with 68% by volume for 50% by value. These statistics illustrate the importance of the on-trade in value terms to all categories, whilst volumes for all products are driven through the off trade channel.

[7] British Beer and Pub Association website www.beerandpub.com

[8] Sales values presented at Retail Sales Prices (including VAT and Excise Tax)

[9] Private label beer sales are sold mainly through the off-trade and account for just 4% of total volume of beer, but 1% of total value.

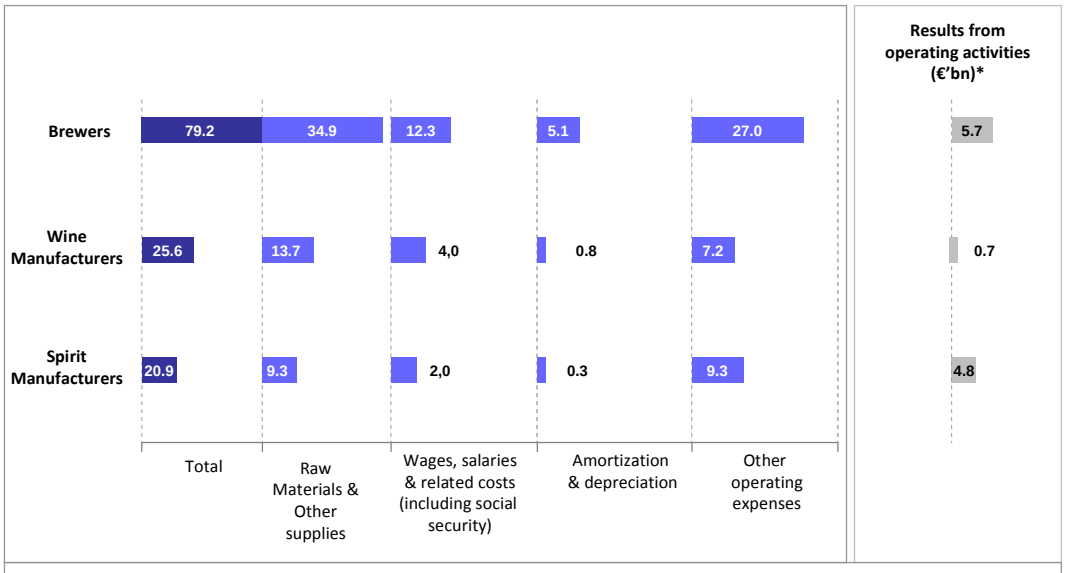
Summary

- The alcoholic beverage sector in Europe is of significant size, with sales of beer in absolute terms accounting for the highest proportion by value and volume.
- However, the brewing sector is fundamentally a high volume business, but with comparatively low margins across the whole value chain.
- The spirits industry has lower value of sales than beer in absolute terms, but enjoys higher margins that beer or wine in both absolute and percentage terms.
- Wine sales are one and a half times greater in value than those for spirits, but still less than the value of sales for beer
- 87% of the margin made in the value chain across all categories of alcoholic drinks are enjoyed by the retail sector, and of this almost 90% is achieved in the on trade, which is illustrative of the importance of this route to market and the reliance of the on-trade on margin generated from sales of alcohol.
- Beer is the largest contributor to on trade margins supporting more than half the margin made in the on-trade channel.
- Alcoholic beverage manufacturers achieved just 9.6% of the total margin in the value chain and of this, almost half was realized by spirits €1.12bn
- Brewers achieved a margin of €0.97bn, and whilst the margin for wine was just €421m, wine received €0.51bn in 2007 in direct subsidies.

3.3 Comparable cost of production for Beer, Wine and Spirits

In this chapter we explore the relative costs of production for the different categories of alcoholic drink. The following chart summarizes our main findings regarding spending per category in the areas of raw materials (and other supplies to alcohol producers), wages and salaries and amortization and depreciation. The choice of these categories has been driven by the availability (or otherwise) of public information and the need for this information to be consistent, i.e. the need for comparison of homogeneous data.

Chart 7: Total manufacturers costs (€ bn) in 2007



* This figure accounts for Earnings Before Interests, Taxes and Outstanding results which better approximates the profitability of operating activities

Source: Dun & Bradstreet/Amadeus/ Companies Public Financial Report

Raw materials and other supplies

Our analysis confirmed that the alcoholic beverage sector is a large consumer of raw materials and other supplies with spending totaling €57.9bn. It therefore has a significant impact on supplying industries, in particular on agriculture (suppliers of grapes, malt, barley, etc), aluminum, glass and paper suppliers, suppliers that process these raw materials, e.g. maltsters, can manufacturers, makers of glass bottles, crates and pallets, along with suppliers of other packing materials.

The brewing sector is the largest consumer of raw materials and supplies with spending of approximately €34.9bn. The brewing sector consumes high volumes of malt, hops, barley and packaging materials.

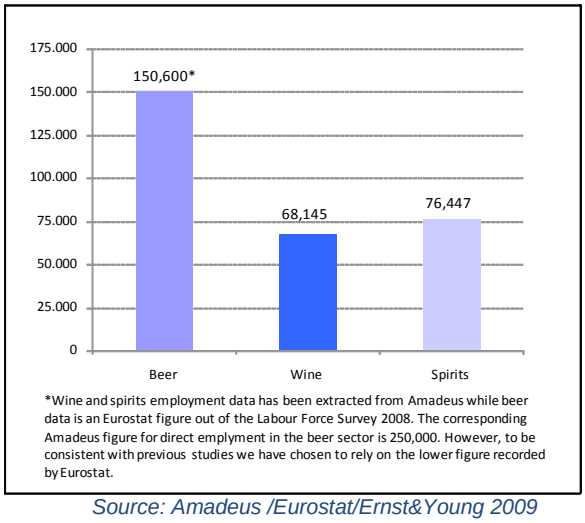
Wine is the next largest consumer with annual spending of €13.7bn, reflective of the high cost of growing and harvesting grapes and the high cost for the type of packaging used. Again this is in correlation with the volume of wine sales.

Spending on raw material and supplies by spirits manufacturers totals €9.3bn.

Wages and employment

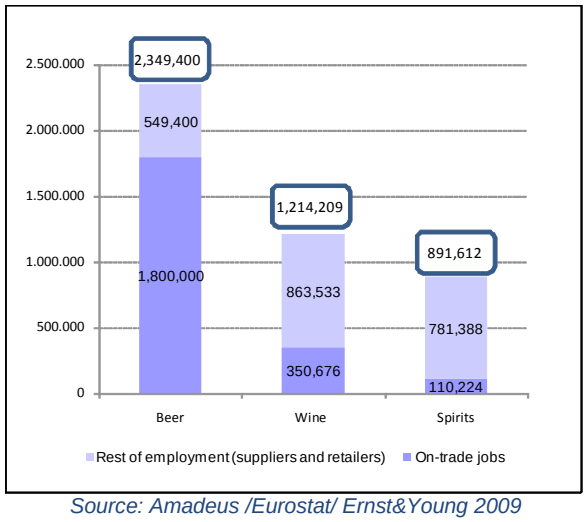
The next highest area of comparable spending by alcohol manufacturers is on wages and related costs. Across the three alcoholic drinks categories total spending in this area was €18.3bn in 2007. This represents total direct employment [10] of approximately **300,000** people, more than half employed in the brewing sector.

Chart 8: Comparison of direct employment



Source: Amadeus /Eurostat/Ernst&Young 2009

Chart 9: Indirect Employment



Source: Amadeus /Eurostat/ Ernst&Young 2009

The European alcohol drinks industry is also a significant driver for employment in related sectors (see Chart 9). The total for indirect [11] jobs generated by the alcoholic beverages sector is approximately 4.45m as of end of 2007. Of this number, approximately half (2.25m jobs) are employed in the on trade mainly in bars, clubs, restaurants and hotels. Most of this on trade employment (1.8m jobs) is generated by the beer sector. This is reflective of the reliance of the on trade on margin generated by the beer category.

[10] Employment data corresponds to aggregated information from Amadeus financial database, except for beer which employment information was available on the study "The contribution made by beer to the European Economy" (Edition 2009) undertaken by Ernst & Young

[11] Rest of employment (suppliers and retailers) calculations were prepared based on Amadeus, Eurostat information and the Ernst&Young report ("The contribution made by beer to the European Economy", Edition 2009)

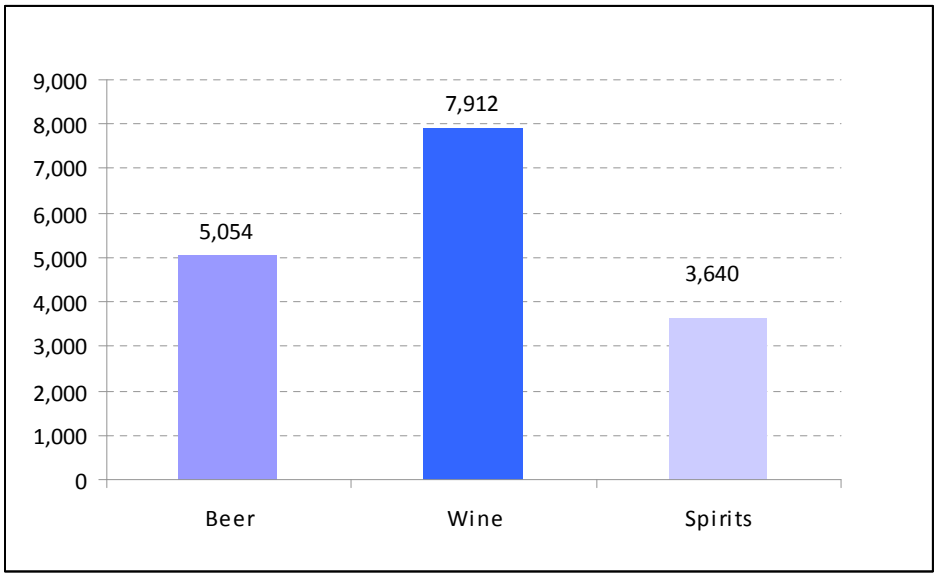
The remainder of the indirect jobs generated by the alcoholic beverages sector are spread across supplier industries (reflective of the €57bn spent in this area) and in the off-trade. Most of these jobs (1.6m) are split evenly between wine and spirits, with beer generating 550 thousand jobs.

Further detailed information regarding indirect employment in the beer sector is available[12] in a report prepared by Ernst & Young. However, no further analysis of indirect jobs generated by the wine and spirits sectors was undertaken as part of this study, so no further comparison of these remaining jobs is possible here.

Distribution costs

An analysis of the cost of distribution shows that producers of wine incur the highest costs €7.9bn in 2007. This could be indicative of a combination of higher wine volumes than spirits and longer distances traveled than beer. The brewing sector by contrast transports large volumes, but typically over short distances being predominately local businesses.

Chart 10: Distribution Costs



Source: PwC Analysis

3.4 Comparable cost per litre pure alcohol

The final sections of this report consider the impact of excise taxation. Excise taxes are a significant component of the cost of producing and retailing alcoholic beverages and ultimately the price paid by the consumer. Excise taxes are generally based on alcohol content and therefore in the first instance we have undertaken a comparative cost analysis (excluding excise tax) for the manufacturer to:

[12] "*Contribution made by beer to the European economy*" a report by Ernst & Young Netherlands (2009),

(a) produce a litre of finished product for each drink (i.e. total value divided by total volume sold);and,
(b) produce a litre of pure alcohol in each product, i.e. a litre of alcohol in spirit, a litre of alcohol in wine and a litre of alcohol in beer (this is achieved dividing the cost of a litre of finished product by the average alcoholic strength for each drink and then multiplying by 100).

Chart 11: Comparable cost per Litre of Finished Product

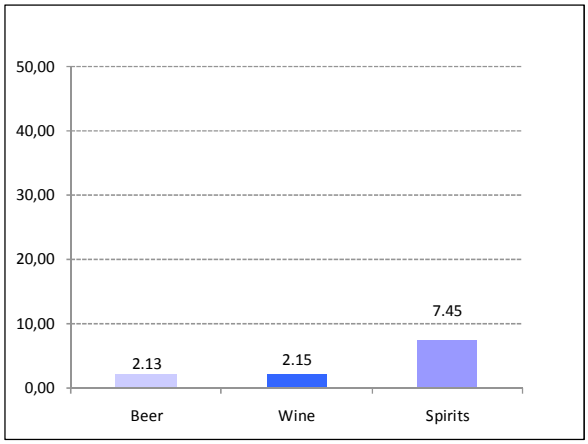
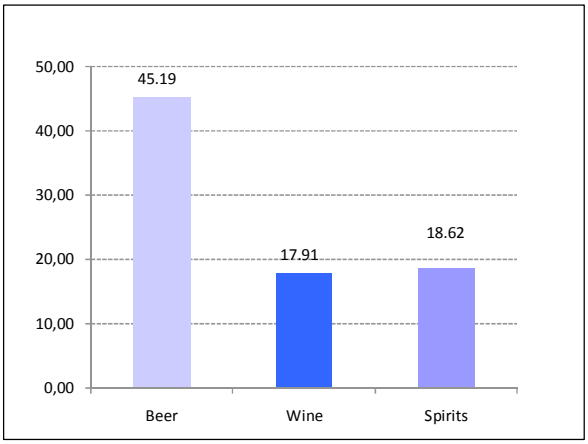


Chart 12: Comparable cost per Litre of Pure Alcohol



Source: PwC Analysis

Chart 11 is an illustration of the comparable cost per litre of finished product, i.e. a litre of beer, a litre of wine and a litre of spirit.

This illustrates the comparative cost of producing a litre of finished product and shows that the comparative cost is highest for a litre of spirit (such as Whiskey or Vodka) at € 7.45. The cost of producing a litre of beer and a litre of wine are less than spirit, but comparable to one another (€ 2.13 vs. €2.15, respectively). This finding is reflective of the cost of producing higher alcoholic content; (a litre of spirit is typically 40% alcohol by volume per litre bottle, compared to 12% alcohol for a litre of wine and between 4 and 5% for a litre of beer (a calculated average across the EU of 4.7% abv. is used in this report).

However, when these costs are adjusted to reflect the cost of producing a litre of pure alcohol in each of these drinks this produces markedly different results.

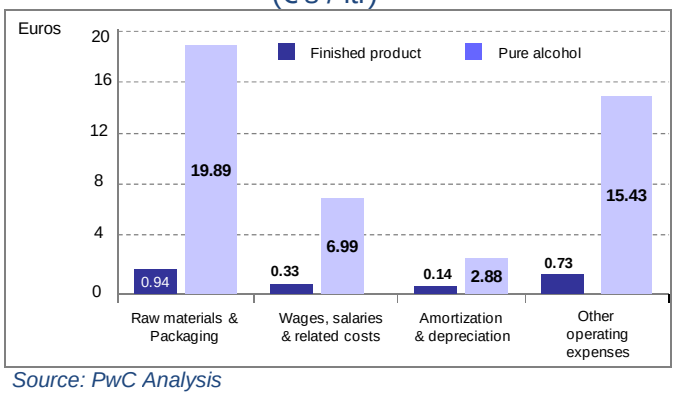
The cost of producing a litre of pure alcohol in

- Beer rises from €2.13 LFP to €45.19 LPA;
- Wine rise from €2.15 LFP to €17.91 LPA; and
- Spirit from €7.45 LFP to €18.62 LPA

Beer is the most costly beverage to produce per litre of pure alcohol, costing approximately **2.5** times or **€27** more per litre alcohol than either wine or spirit.

The following charts show a comparison between the cost per litre finished product to the cost per litre pure alcohol by drink category:

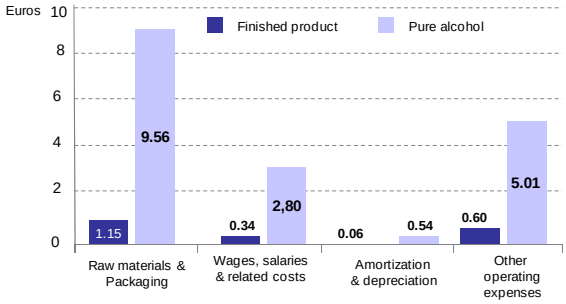
Chart 13: Brewers costs
(€'s / ltr)



Source: PwC Analysis

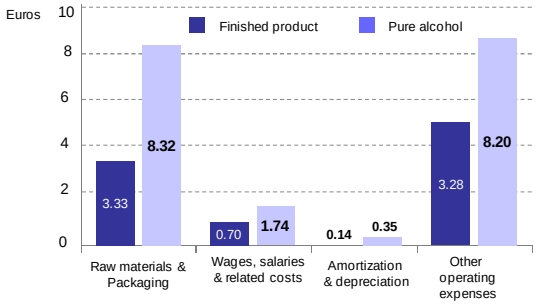
The amount of alcohol in beer (between 4 and 5% alcohol by volume) is comparatively low compared to wine (12%) and spirits (40%) in the respective most common product ranges. For a brewer to produce a litre of pure alcohol in beer requires production of 20 to 25 litres of finished product (8 to 8.5 times the volume of finished product than spirits). This is reflected in the comparatively high cost of raw materials and packaging in the above chart. Beer is a high volume business and requires significant investment in plant and machinery, e.g. bottling and canning lines. This is reflected in the comparatively high figure above for amortization and depreciation.

Chart 14: Wine Manufacturers costs
(€'s / ltr)



Source: PwC Analysis

Chart 15: Spirits Manufacturers costs
(€'s / ltr)



Source: PwC Analysis

Wine and spirits have a higher concentration of alcohol than beer and therefore require less volume to produce a litre of pure alcohol (just over 8 litres of wine and 2.5 litres of spirit). Figures for raw materials and packaging per litre pure alcohol for these drinks are higher for wine than spirits but the figures are broadly comparable for these categories compared to beer. Wine has slightly higher costs than spirits for both wages and amortization and depreciation per litre pure alcohol. However, the production cost of a litre of pure alcohol in wine and spirit are comparable.

3.5 Impact of taxation

Indirect taxation in the form of value added tax (VAT) and excise tax is a material component within the final selling price of alcoholic drinks, representing on a weighted average between 21% and 40% of the retail price.

VAT is typically applied at the standard rate to domestic sales of all categories of alcoholic drinks and is applied to the net price of the product, inclusive of excise. The impact of VAT should be neutral for the purpose of this study as it is applied at the same rate to each of the different drinks categories. However, differences in excise taxation per category of alcoholic beverage impact the tax base to which VAT is applied. This means that the impact of VAT is higher where one product is subject to a positive rate of excise, whilst another is subject to a zero, or reduced rate. We have

not undertaken a detailed analysis of this "multiplier" effect for the purposes of this study, but have instead focused on the cause of this imbalance, being the difference in the excise position.

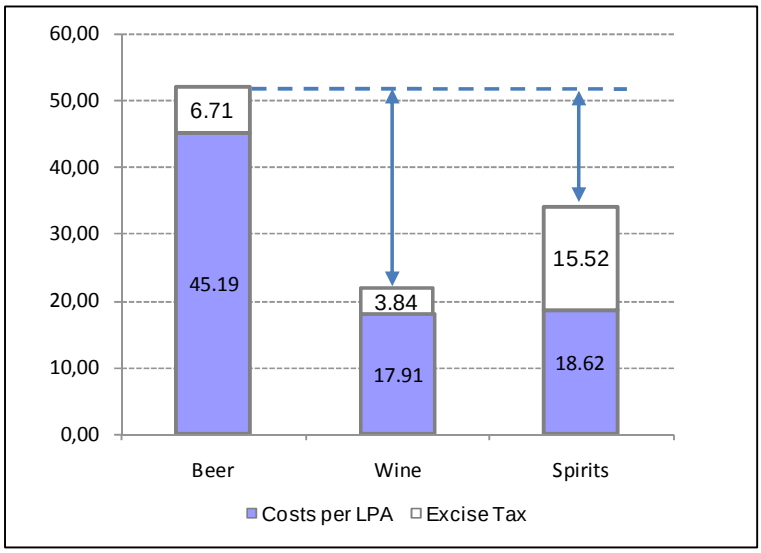
Excise is a tax on alcoholic beverages[13]. The basis for taxation is set out in the EU *Structures Directive*[14] and the EU *Minimum rates Directive*[15]. The *Structures Directive* sets out the basis for taxation of different products, whilst the EU *Minimum Rates Directive* sets the minimum excise rate to be applied to each category. This leaves Member States the freedom to select the national rate of excise per drink category, provided this remains above the EU minimum level for the category of alcoholic drink concerned.

The result of this regime of taxation is that different products are taxed differently within the same Member State and at different rates from one Member State to another.

Excise duties are paid by the producer. However, there is some debate as to the extent that excise taxes are simply collected by producers on behalf of fiscal authorities or are a tax on production. Our analysis suggests that whilst excise tax clearly forms part of the final price of the product, it is not always possible for producers to pass-on excise tax increases to customers. Under this scenario, excise clearly becomes a tax borne. Producers also bear all the costs of accounting for excise tax and any risk associated with bad debt.

To demonstrate the comparative impact of including excise taxes on manufacturing costs, we have repeated Chart 12, but including average EU excise tax rates for beer, wine and spirits. This shows that, whilst the excise tax on a litre of pure alcohol in the forms of distilled spirits is greater than that of beer and wine (€15.51 compared to €6.71 and €3.83 respectively), this difference is not enough to offset the additional manufacturing cost in the case of beer. The difference between beer and spirits remains at €18 Euros per litre of pure alcohol. The difference between beer and wine is €30 per litre of pure alcohol.

Chart 16: Comparable cost per LPA including Excise Tax



Another way of assessing the comparative impact of excise taxation rates is to consider the retail selling price of alcoholic beverages.

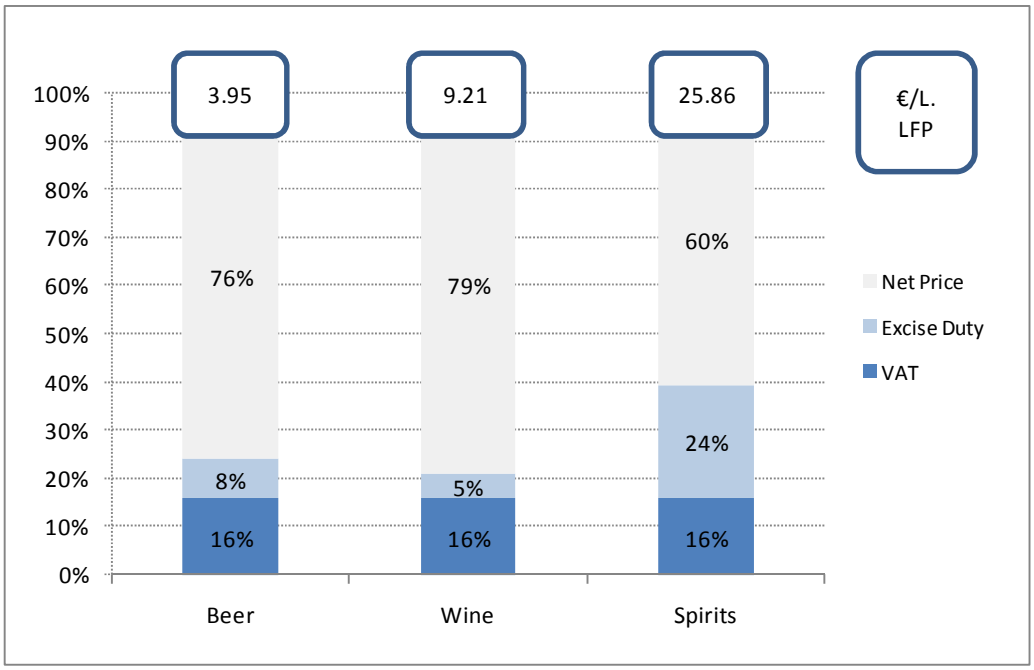
[13] The EU also applies excise to other products such as cigarettes, tobacco and oil based products which fall outside the scope of this study

[14] Council Directive 92/83/EEC of 19 October 1992 on the harmonization of the structures of excise duties on alcohol and alcoholic beverages

[15] Council Directive 92/84/EEC of 19 October 1992 on the approximation of the rates of excise duty on alcohol and alcoholic beverages

The chart below shows the weighted average retail price of a litre of *finished* product for each category of drink and breaks this cost down to show the percentage that represents the net price (price before indirect taxation), as well as the percentage that is excise tax and VAT.

Chart 17: Weighted retail price on & off-trade €/LFP



Source: PwC Analysis

The average price of a litre of spirits is €26 compared to €4 for beer and €9 for wine[16] in 2007. In terms of excise tax, at first glance, spirits appears to be disadvantaged, with 24% of the price accounted for by excise tax, compared to 8% for beer and 5% for wine. However, the percentage concentration of alcohol per litre *finished* product is, on average, over eight times higher in spirits (40% abv) than for beer (4.7% abv) and more than three times that of wine (12% abv) so in fact it can be argued that excise as a proportion of average retail price favors spirits against beer. i.e.:

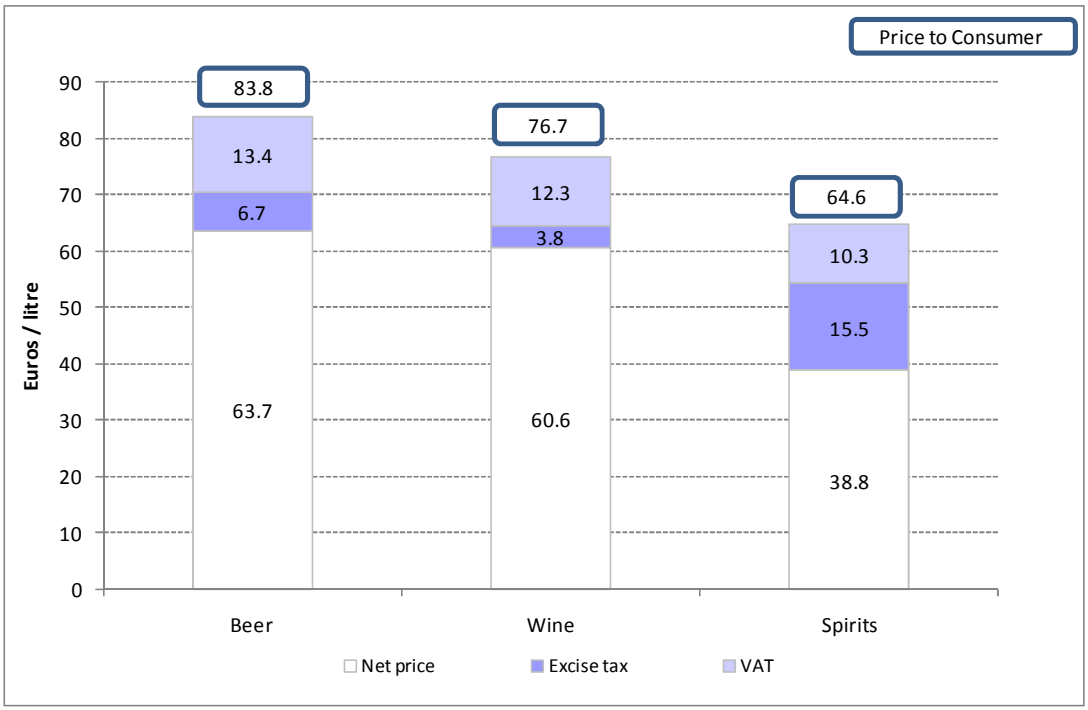
-for beer, 4.7% of the product is alcohol, but excise tax accounts for 8% of the price,
-for spirits, 40% of the product is alcohol, and excise tax accounts of 24% of the price.
-for wine, 12% of the product is alcohol, and excise tax accounts for 5% of the price.

As when considering manufacturing costs, the impact of excise taxes in relation to the price to the consumer becomes clearer when considering the comparative price of a litre of pure alcohol in each category of alcoholic beverage.

[16] Retail sales prices in this chart have been obtained consolidating all sales volumes (in liters) and values (in Euros), both on&off trade, of the 7 cluster EU-countries analyzed the current study (see Appendix F of Chapter I – Impact of tax changes for details on methodology), extrapolating then these figures to the total EU-27 member states and dividing finally the resulting figures by drink category. Data sources employed for sales volumes and value in the 7 member states were Ernst&Young report for beer ("The contribution made by beer to the European Economy", Edition 2009) and Datamonitor for wine and spirits.

3.6 Retail price per category of drink per litre pure alcohol

Chart 18: Average retail price of Drinks in terms of litre of pure alcohol



Source: PwC Analysis

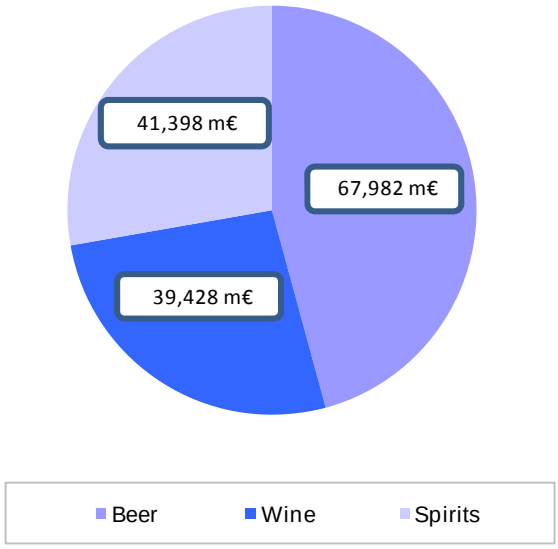
The graph confirms that to deliver alcohol in beer is the most expensive in terms of price to the consumer. The weighted average price of a litre of 100% alcohol in the form of beer is €84 compared to €77 in wine and €65 in spirits. This reflects the higher cost of producing and delivering alcohol in the form of a lower alcohol dilute beverage. Although the average rate of excise tax on spirits is just over two times that of beer, this difference is not enough the offset the additional costs of producing and delivering beer to the consumer.

This report has highlighted that the cost of producing alcohol in beer is considerably higher than producing alcohol in the form of distilled spirits. This, is reflected both in the analysis of producer costs and also in the final price to the consumer. Apart from any health and social considerations, this reflects one reason why spirits generally have a higher tax rate than beer and wine in most countries across the world. However as the comparative analysis shows, in Europe, the current rates particularly disadvantage beer in terms of cost to the consumer. Clearly any move to taxing products solely based on alcohol content (unitary taxation) would further disadvantage beer.

3.7 The tax contribution by the alcoholic beverage sector is significant

The final section of this report briefly highlights the importance of the alcoholic beverage sector in terms of the total tax contribution to member state governments. In 2007, whilst excise taxes on alcoholic beverages raise over €35bn, VAT on sales contributes a further €52bn, employment taxes an additional €56bn and corporation tax €6bn.

Chart 19: Tax contribution by the alcoholic beverage sector within the EU[17]



Beer	m€ VAT	23,294	67,982
	m€ ET	12,220	
	m€ EIT	11,224	
	m€ SSC	18,718	
	m€ CIT	2,526	
Wine	m€ VAT	17,399	39,428
	m€ ET	5,588	
	m€ EIT	5,522	
	m€ SSC	9,208	
	m€ CIT	1,711	
Spirits	m€ VAT	11,490	41,398
	m€ ET	17,254	
	m€ EIT	4,173	
	m€ SSC	6,959	
	m€ CIT	1,522	

Of the total tax contribution of the alcoholic drinks sector, beer sales contributes 46%, wine sales 26% and spirits sales 28%.

[17] ET stands for Excise Tax; EIT is the Employee (or Personal) Income Tax; SSC are the Social Security Contributions comprised by the financial payments of employees and employers in order to obtain access to the social security system (this SSC figure includes total employment effect of each drink); and CIT is the Corporate Income Tax

PRICEWATERHOUSECOOPERS

Appendix

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Appendix A – List of companies as representative sample

Table 1: Brewers included in the study

Country	Brewers	Market share 2007
Spain	Heineken España	32%
	Mahou San Miguel	21%
	Damm SA	14%
Czech Republic	Plzensky Prazdroj, A.S.(SAB Miller)	48%
	Pivovary staropramen (InBev)	16%
	Budejovicky Budvar	8%
	Starobrno [18]	5%
Poland	Kompania Piwowarska (SAB Miller)	37%
	Grupa Żywiec S A (majority owned by Heineken)	33%
	Carlsberg Polska S.A.	14%
	Browar Kielce SP Z O O (Browar Belgia)	4%
	Royal Unibrew Polska SP.Z	1%
Germany	InBev	11%
	Scottish & Newcastle	10%
	Bitburger	9%
United Kingdom	Carlsberg	14%
	Scottish & Newcastle	27%
	Inbev UK	18%
	Molson Coors Brewing Company	20%
France	Heineken	31%
	Brasseries Kronenbourg (Scottish & Newcastle)	24%
	InBev	10%
Finland	Carlsberg (Sinebrichoff)	50%
	Scottish & Newcastle	36%
	Olvi Group	7%

Source: Datamonitor market analysis

[18] This company has merged recently with Královský pivovar Krušovice as of 01.06.2009

Table 2: Wine companies included in the study

Country	Wine Manufacturers	Market share 2007
Spain	Freixenet	2.0%
	Codorniú	1.0%
	González Byass	0.1%
Czech Republic	Vinium Velké Pavlovice	16%
	Znovin	9%
Poland	Ambra SA	23%
	Jantón SA	13%
	Castel Freres	4%
Germany	Reh Kendermann	9%
	Moselland	8%
United Kingdom	Constellation Europe Ltd.	8%
	Foster's EMEA Ltd.	3%
France	Patriarche Kriter (SA KBB)	27%
	Roche Mazet	9%
	St. Chinian	7%
Finland	Pernod Ricard Finland	27%
	Gran Sasso Ortona	7%
	Pearly Bay Winery	3%

Source: Datamonitor market analysis

Table 3: Spirits companies included in the study

Country	Spirit Manufacturers	Market share 2007
Spain	Diageo	15%
	Bacardi	11%
	Beam Global Spirits & Wine Hold	6%
Czech Republic	Jan Becher	10%
	Palrina	4%
Poland	Przedsiebiorstwo Polmos Bialystok	19%
	Bols SP (Unicom Bols)	9%
Germany	Diageo Deutschland	8%
	Pernod Ricard	6%
United Kingdom	Diageo	29%
	Glen Catrine Bonded Warehouse	11%
	Pernod Ricard	9%
	Bacardi Martini	4%
France	Pernod Ricard	27%
	SVS La Martiniquaise	11%
	Diageo	7%
	Marie Brizard & Roger	4%
	William Pitters	4%
	Chartreuse Diffusion	4%
Finland	Diageo Plc (Hartwa)	25%
	Chymos Juomat Oy	7%
	Moet- Hennessy	3%

Source: Datamonitor market analysis

Appendix B – Comparable cost model

Once all the information has been entered into the cost comparable model, all available average cost ratios were calculated for each company within the value chain and for all the countries considered in the study.

Following, and taking the average of a cost ratio for the different companies considered in the model, we calculated, for a combination of industry and country, the average cost ratio expressed as % over Net Revenues as an average of averages as a valid indicator of the weight of costs by country and industry. When available, more than one year of P&L data for each company was entered in the model to gain robustness out of extended history in the operations, costs and margins of a company. This level of data elaboration would let us deploy the report on comparable costs for each Member State.

In order to gain a global European view and produce the EU level of analysis, the way to approach the EU cost average ratios was to calculate a weighted average cost ratios considering market sales in each country. At this point of our methodology, we had extrapolated the value of the market at European level taking the volume in litres sold in the 7 cluster-countries against total litres sold in the EU.

Figure 11: Country Cost Analysis Model

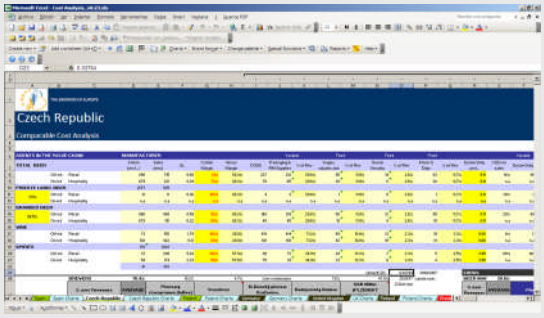
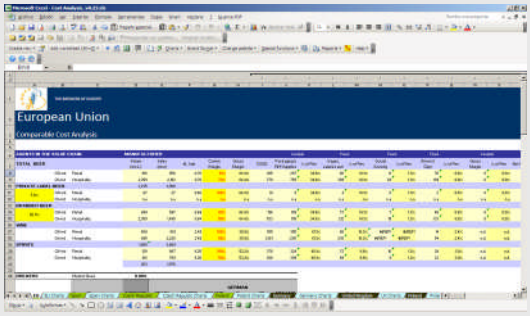


Figure 12: EU Cost Analysis Model

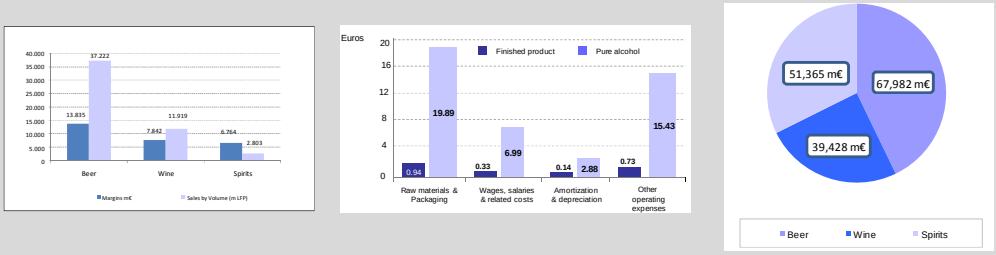


Once the calculation phase was completed, we made final verifications and double-checks to the model to make sure that figures and assumptions were reliable. As a result, the following charts and analysis for each country have been prepared for the study among others:

- Value chain analysis per alcoholic beverage in terms of costs, valued added and net margins
- Analysis of average ratios by manufacturer
- Comparison of sales by volume and value by type of beer (branded beer vs. private label beer) delete?
- Comparison of sales by volume and value in the on-trade and in the off-trade channel.
- Analysis of total costs for beer, wine and spirits (by volume)
- Analysis of total costs for beer, wine and spirits per €/litre of finished product
- Analysis of total costs for beer, wine and spirits per €/litre of pure alcohol

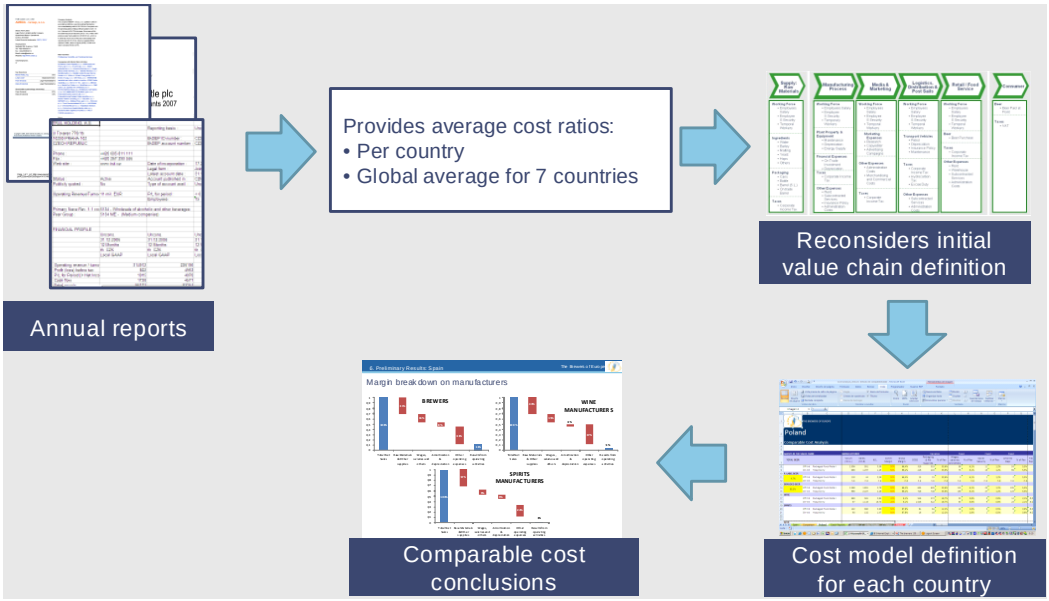
All the above was finally prepared and calculated to be represented in different charts accompanied by comments and interpretations to our best understanding of the economic reality described.

Figure 13: Examples of charts as model output



The following chart describes a final summary of the detailed methodology we have followed through the project in order to prepare the comparable cost analysis:

Figure 14: Comparable Cost Methodology



Appendix C – Data Source

The data sources that have been used within the report to provide data from individual companies and at whole market level are classified as follows

a) Market Information Sources
b) Companies Financial Information Sources
c) Brewers Associations
d) PwC Questionnaire

Market Information Sources

Market information has been obtained through reports and studies of the following specialized groups:

- Datamonitor

Provider of global business information, delivering data, analysis and opinion across the Automotive, Consumer Markets, Energy and Utilities, Financial Services, Logistics and Express, Pharmaceutical and Healthcare, Retail, Technology and Telecoms industries.

In the Retail sector the information covered has been:

- Market dynamics – key market data, forecasts, issues and challenges in the sector
- Retailers – analysis of strategy, financials, store strategy and customers
- Consumers – changing usage and attitudes towards retail
- Channels and location – use of space, stores, locations and retail channels

- Nielsen

Worldwide marketing and media information company supplying information on:

- Consumer Packaged Goods – Global retail trends, the relationship between retailer and manufacturer or in-store consumer behavior, etc
- Media – Contents on television, entertainment, sports and Advertising
- Telecom

- Canadean

Global market research providing benchmarks and comparable data on beverage markets. Its studies include information on drinks, packaging and allied supplier industries worldwide.

- Alimarket

Publications Alimarket, SA is specialized in generating information of economic content from different sectors in the Spanish market: food and beverages, hotel and tourism, consumer products non-food (drugstore, perfumery, DIY, textiles, toys, ...), appliances and consumer electronics, packaging, transportation and logistics, healthcare and general business management.

- Business Monitor International

Business Monitor International offers information products and trough newsletters, reports and directories on three main areas of expertise: Country Risk BMI's country risk and macroeconomic

forecast portfolio includes weekly financial market reports, monthly regional Monitors, and in-depth quarterly Business Forecast Reports.

Financial Information Sources

In order to get to manage valid financial information of the main companies of the brewing, winery and spirits sector of the different countries, PricewaterhouseCoopers national and regional offices, and their specialized Knowledge Centers, have obtain the financial statements from companies operating in their markets from the following sources:

- Financial Reports registered at the national mercantile records in the countries studied.

- Amadeus

Amadeus is a comprehensive, pan-European database containing financial information on over 11 million public and private companies in 41 European countries. It combines data from over 30 specialist regional information providers (IPs).

- Dun & Bradstreet

It is a world-class source of commercial information and insight on businesses. D&B's global commercial database contains more than 140 million business records. The database is enhanced by D&B's proprietary DUNSRight® Quality Process, which provides quality business information.

- Thomson Reuters

Information for businesses and professionals in the financial, legal, tax and accounting, scientific, healthcare and media markets. Thomson Reuters operates in 93 countries.

- SABI

Spanish database containing financial information on over 1,500,000 public and private companies in Spain and Portugal.

- Emerging Markets Information Service

EMIS delivers news, company and financial data direct from more than 80 emerging markets in Asia, Latin America, Central and Eastern Europe, the Middle East and Africa. The emerging markets business intelligence information managed comes straight from the local markets and from over 16,000 publications.

Brewers Associations

1. The Brewers of Europe

The Brewers of Europe has been the major source for the recompilation of publicly available information and data of the brewing sector. Through the Brewers of Europe we have had access to publicly available information from brewing companies, market information as well as orientation on the analysis of the data.

2. Local Brewer Associations

Within the local brewer associations, the collaboration has been closer with those associations of the countries studied independently in the cluster analysis:

- British Beer & Pub Association
- Czech Beer and Malt Association (Český Svaz Pivovarů a Sladoven)

- Deutscher Brauer-Bund
- Finnish Federation of the Brewing and Soft Drinks Industry
- Union of the Brewing Industry Employers in Poland - Browary Polskie
- The Brewers of Spain

Again all information supplied has been available in the public domain

PwC Questionnaire

Through The Brewers of Europe and the local brewing associations, a questionnaire has been distributed to the main companies of the market of each country in order to obtain publicly available information on:

- Supply of raw materials to manufacturers – Employment, Revenues and Net-income of companies operating in the sub-industry.

- Beer Manufacturing Process – on-trade investments, average % of promotional/merchandising spending over revenues, average % of commercial market research.

- Media and Marketing – Employment, Revenues and Net-income of companies operating in the sub-industry

- Logistics and Distribution – Employment, Revenues and Net-income of companies operating in the sub-industry, Transportation Costs, Equipment Logistics.

- Off-trade/On-trade – Employment, Revenues and Net-income of companies operating in the sub-industry

Appendix D – Exchange Rates

For our calculations in the comparable cost model, the P&L figures of companies in Member states out of the eurozone[19] needed to be converted into Euros for comparable purposes applying the following exchange rates:

Currency	Euro exchange rate
Czech Koruna (CZK)	26.667
Polish Złoty (PLN)	3.626
Pound Sterling (GBP)	1.357

Source: www.oanda.com

These exchange rates are fixing prices as of 31/12/2007 according to the closing date of the financial reports that were available and have considered in our model at the time of the preparation of this study.

[19] The eurozone (officially the euro area) is an economic and monetary union (EMU) of 16 European Union member states which have adopted the euro currency as their sole legal tender. It currently consists of Austria, Belgium, Cyprus, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia and Spain.

Glossary

Average strength	Percentage of alcohol volume in alcoholic drinks; in the case of beer, each country within the European Union gets its own average strength for our analysis and calculations as reported by the 2009 Statistical Handbook published by the British Beer and Pub Association
Bottom-up methodology	Analysis of a selection of companies comprising an industry starting from its data aggregation in a significant total market share and building up from the resulting figures a consolidated industry view
Branded Beer	Beer labeled by a distinctive word or symbol indicating a trademark with exclusive rights
Brewers	Companies dedicated to the production of beer from malt and hops by infusion, boiling, and fermentation
Brewing sector	Involves all companies dedicated to the manufacturing of beer
Cross-price elasticity of demand	Measure of the percentage change in the demand for a product or service following a variation by 1% in the price of another good
Cluster	Set of individuals or observations regarded similar or homogenous according to objective criteria
Correlation coefficient	Statistical measure of the degree of linear relationship between two variables. It can take values in the range from -1 to 1. A correlation coefficient of -1 indicates that there is a perfect negative linear relationship between the variables. This means that any change in the level of one variable is followed by a variation of opposite sign and fixed amount in the other. A correlation of 1 is indicative of a perfect positive linear relationship between the variables. A correlation of 0 means that the two variables are not linearly related
Demand elasticity	(see Own-price and Cross-price elasticity of demand)
Direct Employment	Employment created by the brewers or its manufacturing activities
Distribution and Logistic	Activities involving total output or income being distributed among On-trade establishments or individuals
Econometrics	Statistical techniques for the analysis of data which allow inferring the relationship between different variables
EU	European Union (Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary Ireland, Italy Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom)

Excise Tax	Tax levied on the volume production. In the case of alcoholic beverages, it involves taxation according to the level of alcohol
Government Revenues	Amount of money received by the government from outside the government entity
Hectoliter	Measure equivalent to 100 litres
Indirect employment	Number of jobs generated by the beer industry in related sectors
Level of pass-through	Measured as the percentage variation in the price of beer net of excise taxes following a variation of 1% in the excise tax rate
LFP	Litre of finished Product
LPA	Litre of Pure Alcohol
Manufacturing processes	The act of making a product from raw materials from the acquisition of Raw materials to the production of a finished product, ready to be consumed or distributed
Market Share	Percentage sold by a company, product or brand over the total sales value or volume of a specific market
Net Margin	Percentage of a company's revenue after all costs, expenses and taxes
Net Revenues	Gross Earnings a company obtains with the sail of its product
Off trade	Sales made through retail establishments (shops, supermarket, etc)
On trade	Sales made trough restaurants, cafeterias, pubs and other On-trade establishments that are licensed to do so
Own price elasticity of demand	Measure of the percentage change in the demand for a product or service following a variation by 1% in its own price
Personal Income Tax	Tax levied on the income of individuals or business (corporations or other legal entities)
Price Sensitivity	Awareness of the consumers to the cost of particular product or service they wish to buy in relation to substitutes and its expected utility (see also demand elasticity)
Private Label Beer	Beer with a brand owned not by a manufacturer or producer but by a retailer or supplier who gets its goods made by a contract manufacturer under its own label
Profit and Loss accounts	Accounts compiled at the end of an accounting period to show gross and net profit or loss of a company
PwC	PricewaterhouseCoopers
Regression analysis	(see Econometrics)

RSP	Retail Sales Price
Social Security Contribution	Financial contributions employees and employers paid in order to obtain access to the social security system
UK	United Kingdom
Value chain	Comprises all the activities an organization needs to undertake in order to create or add value to its products or services. It includes design, production, marketing, delivery, and customer support
VAT	Value Added Tax

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