

Impact of recent economic trends on pubs and breweries

A report produced for the BBPA

October 2023

Contents

Topic

Summary

Supporting detail: Economic environment facing pubs & brewers

Annex 1: Landscape of pubs and brewers in the UK

Annex 2: Economic model of pubs and brewers

Annex 3: Current economic impact on pubs and brewers

Annex 4: Methodology and interview findings

About this report

- Frontier Economics were commissioned by The British Beer and Pub Association (BBPA) in Autumn 2022 to analyse the pub and brewery sector, the pressures faced post-Covid, and why the sector is particularly distinctive in the need for support.
- Given the rapidly changing economic environment and pressures faced by the sector, this report provides an update to the economic environment facing pubs and brewers as of August 2023.
- In particular, the focus of this report is to capture how costs and demand have changed since 2019 (before the pandemic) and what is expected to happen over the next year.
- This report does not re-examine the overall landscape and economic model of pubs and brewers which will not have changed. This part of the analysis has been moved to Annex 1 and 2.

The sector continues to face major economic shocks, with differential impacts across firms – while the outlook is better than last year, it remains very challenging

Brewers and pubs continue to face major economic shocks

- Following on from major shock of Covid, the sector is now facing two core shocks:
 - Higher costs: energy, commodity inputs, labour, and interest payments.
 - Weaker consumer demand: cost of living crisis continues to come through, as prices rise faster than wages.
- Brewers are most exposed to higher raw material and energy costs; in a slim margin (~3%) sector these are passed on in higher prices.
- Pubs face these higher input & energy costs plus higher wages / labour shortages. And are particularly exposed to cost of living crisis causing a cutback on discretionary spend.
- While some costs are starting to come down most remain structurally higher than before – and many costs still rising.

Businesses face differential impacts and uncertainty on outlook

- Common shape of impacts across firms all are experiencing pressures to some extent.
- But model differences can affect exposure to specific shocks – timing, magnitude and persistence vary as a result of buying ahead, being 'lucky' with energy contracts / debt, or relative resilience of customer demand.
- Government support has helped firms offset some of the economic pressures – in particular on energy costs, and other reliefs.
- But there is concern about what happens as support comes to an end, and potential additional policy costs on the horizon.
- Furthermore the drivers of the shocks (Brexit, Covid, Ukraine, weaker £, higher interest rates) mean some uncertainty still remains.

Firms have mitigated and passed through higher costs, but margins and volumes under pressure

- Combined scale of cost pressures is substantial, 16% increase in costs for brewers, and up to 43% increase for pubs.
- In response firms have implemented efficiency savings where possible, and passed through higher costs in higher prices.
- But nature of sector and customer demand means higher prices hit volumes, and put margins under pressure.
- Smaller businesses are most exposed they lack the resources of the larger pubcos / brewers to 'weather the storm'.
- Some consolidation and/or market exit is to be expected unless pressures ease – pub insolvencies now picking up - up 76% in H1 2023 – following period when suppressed due to government support.

Pubs and brewers face a range of demand and cost pressures over the next year



CONSUMER DEMAND

- Spending power increasingly squeezed by continued high inflation & interest rates – hits volumes
- 35% of consumers said they would eat and drink out less frequently next month (July 2023) – hit to on-trade



COMMODITIES

- Coming down off peaks but will remain ~20% higher than before
- Longer-term contracts may delay benefits of falling prices for some
- Uncertainty in Ukraine still remains and could push prices back up



FOOD AND DRINK

- Up to 20% higher food COGS persist as raw material & energy prices increase supplier costs
- Brewers continue to pass-through cost increases with an additional 10% increase expected (partly due to duty)



ENERGY

- Despite costs coming down, the sector still face 2-3x higher energy prices now gov support has ended
- Longer-term contracts may delay benefits of falling prices for some



WAGES AND LABOUR SHORTAGES

- National Living Wage expected to rise 5-10% in April 2024, and further rises anticipated beyond that
- Tight labour market & skills shortages (e.g. chefs) drive higher costs



INTEREST RATES

- Rates at their highest point in 15 years, with further increases expected
- Higher debt servicing costs for some firms – and hits consumer demand



DUTY

- 10.1% duty increase in non-draught products will contribute to inflation
- Additional duty increases due in Feb



BUSINESS RATES

- Many pubs face a cliff edge in April 2024 when the rates relief expires
- This is a £12k increase based on the average pub's business rates bill



ENVIRONMENTAL POLICIES

- Anticipated policy action on DRS, EPR and PRN systems
- Uncertain financial & administrative costs risks inflationary pressure

A range of government support packages have helped firms navigate Covid and the energy crisis – but a risk of a cliff edge for firms when these conclude

- The support packages from government over this turbulent period have been vital and helped the industry navigate the challenging economic climate.
- Although things have improved, many challenges facing businesses remain. And there are concerns regarding the end to support on certain costs.
- The sector is keen that government considers the impact of changes to support:
 - **Business rates**: With the last of the rates relief due to expire in April 2024, many pubs face a cliff edge particularly smaller ones ~£12k increase based on average pub's business rates bill.
 - Energy: With the last of support for energy bills due to end in March 2024, pubs and brewers
 continue to face mounting challenges from higher and volatile energy pricing on average twice
 pre-Covid levels.
 - Duty: Despite the new draught relief, the end of the freeze and 10.1% duty increase in non-draught products will contribute to further inflation (with additional duty increases due in Feb).
- In addition the sector is keen that the government consider ways to provide targeted support on key economic issues.
 - **Environmental**: The uncertain financial and administrative costs of DRS, EPR and PRN systems policies risks placing inflationary pressure on businesses.
 - Labour & skills: Accelerating the review of the Youth Mobility Scheme and expanding the Shortage Occupation List would help address the ongoing labour / skills shortages in the sector.

Type of support

Initiatives over the last 4 years

Reduce costs directly

- Energy Bill Relief Scheme (EBRS)
- Energy Bills Discount Scheme (EBDS)

Offset higher costs with savings elsewhere

- · Alcohol duty freeze
- · Freezing the business rates multiplier
- · Small business rate relief
- Supporting small business relief (transition)
- Small producer relief (alcohol duty)
- · New draught relief

Reduce cost of doing business

- Extended Producer Responsibility deferral
- Delay of Deposit Return Scheme in Scotland

Support business adaptation

- Full expensing (replacing Super Deduction)
- 50% First Year allowance deduction extension

Stimulate consumer demand

- · Eat out to help out
- VAT reduction

Targeted Government support for pubs and brewers can help sustain this important & vibrant sector

Pubs play an outsized role in communities across the UK – and depend on brewers

- Individually small businesses but collectively a big source of jobs (nearly 1m employed)
- Present in every part of the UK, which means benefits are widespread
- Goes beyond economic impact of jobs, to include role as social hub
- Brewers provide a key input to successful pubs

Pubs are particularly exposed to combination of cost and demand shocks

- c.40% combined cost pressure facing pubs – food, drink, energy, labour all more expensive
- Costs hard to avoid: require energy to make hospitable & run kitchens; people intensive service businesses
- Cost of living crisis risks cuts to discretionary spending – which exposes spend at pubs

All firms are exposed, but small independents face biggest risk

- Larger pubcos & brewers more exposed to cost increases (fewer reliefs). But many have resources to fall back on temporarily – or options to cut capex / divi, issue debt
- This could help their managed pubs, and may also extend to some L&T pubs
- Independent pubs (50% of all pubs) & brewers (~1.8k) don't have access to these, so face closure if costs can't be covered

Cost increases
are largely
passed on to
consumers but
this risks
harming
demand

- Scale of cost increases can't be absorbed or mitigated in full – brewers and pubs have passed most onto consumers (12% increase in average price of a pint YOY)
- Higher prices support revenues but can mask falling volumes – as customers cut back
- This is a challenge given the low margins

Ensuring a healthy pub sector also helps brewers, which rely on the on-trade

- Brewers depend on healthy on-trade, and independents within that – important source of sales and profit
- Small and medium sized brewers typically even more so (as limited off-trade) – 95% of sales to on-trade
- Equally pubs benefit from a vibrant brewing sector offering variety

Contents

Topic

Summary

Supporting detail: Economic environment facing pubs & brewers

Annex 1: Landscape of pubs and brewers in the UK

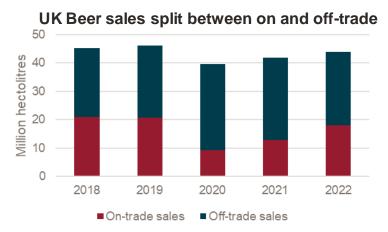
Annex 2: Economic model of pubs and brewers

Annex 3: Current economic impact on pubs and brewers

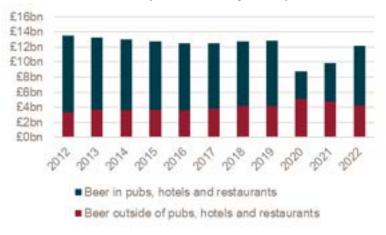
Annex 4: Methodology and interview findings

Brewers hit by Covid lockdowns that cut on-trade volumes, followed by increasing costs – these look to have peaked, but remain structurally higher

- Covid exposed brewers to lower sales through pubs, although those who also sell via off-trade (or D2C) able to rebalance to some degree. Total volumes were down 20-30% during lockdowns and remained below pre-Covid levels during the rest of 2020 / 2021, while off-trade increased to nearly 80% of total.
- Post-Covid, cost inflation picked up due to shortages and supply bottlenecks driving up raw materials & distribution costs, before Ukraine war led to surge in raw material & energy costs. Further pressures from devaluation in the pound, which increases the cost of key \$-denominated raw materials (although since recovered, and £ also strengthening against €), along with rising interest costs for those with floating debt.
- Timing, magnitude, and persistence of the impact on specific firms varies given different contract positions, levels of hedging and forward purchasing across operators but all have been and continue to be exposed to some extent despite the recent reduction in inflation.
 - Energy was the #1 issue those out of contract faced 130-140% increases, which would have been significantly higher without government support. Energy costs have started to reduce but still remain as much as double previous levels. And longer-term hedging delays benefits of falling prices for some.
 - Raw ingredients costs increased by around 30% but are forecast to start coming down over the next year. However this is heavily dependent on the situation in Ukraine.
 - Other increases in **packaging** costs, with glass bottles up at least 35%, with further costs potentially arising due to inadequate DRS and EPR schemes; **CO2**, a small input but shortages have spiked prices up ~3,000%; and **labour** up [6%], but less exposed to shortages facing pubs / wider hospitality.
- In addition, some brewers are exposed to fragile suppliers, where they have outsourced logistics to wholesalers a slim margin sector exposed to high fuel costs and HGV driver shortages.



UK household expenditure on beer remains lower than it was in 2019 (inflation adjusted)



Sources: BBPA- Digital Handbook A6, C3 and C5.

Higher brewers costs are largely passed through to pubs and customers – and while some cost reductions forecast, overall costs expected to remain structurally higher

The three main cost categories for brewers are duty, production and sales – with slim margins above those costs

- The cost profile (mix) is broadly similar across brewers and beers, although model differences can affect the mix these include on / off-trade mix (which affects packaging), extent of outsourced activity (e.g. logistics), and contract brewing (which has production costs but no sales/marketing costs).
- Larger brewers produce at significantly lower cost per hl reflecting scale economies. Efficient operations rely on high asset utilisation to spread fixed cost of operation, and optimised logistics.
- Brewers typically operate with very slim margins: ~3%. This makes absorbing any cost increases challenging.

Brewers face cost increases of around 16% – sets scale of challenge to mitigate, pass-through or absorb.

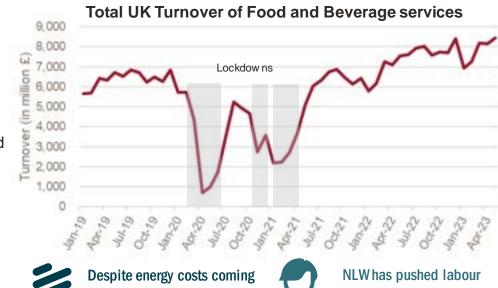
- Brewers working to mitigate cost increases through efficiency savings where possible – but scale of cost pressures and slim margins / competitive sector means higher costs inevitably lead to higher prices (e.g. 11% increase in the price of a can of lager in the last 12 months to July).
- Higher prices hits volumes, with consumer demand under pressure.
- While some costs have started to come down, the structural shift means they will remain significantly higher than pre-Covid – and many costs continue to rise.

	2040	Change		2024
Illustrative brewer cost Base *	2019 · sales (gross)	Actual 2019 v '23	Forecast 2023 v '24	2024 % sales (gross)
Duty	40%	-	+5%	42%
Production	28%			34%
- Raw materials	14%	+30%	-5%	17%
- Energy & water	5%	+65%	-20%	7%
- Labour (production)	5%	+20%	+5%	6%
- Other production	4%	-	-	4%
Distribution	6%	+15%	+5%	7%
Sales & admin	20%	+20%	+5%	25%
Packaging	2%	+20%	+5%	3%
Combined cost pressure*		+14%	Additional +1%	+16%

Highlights scale of cost pressure – to absorb, mitigate or pass-through Recent price inflation consistent with level of cost pressure shown specific brewer impacts will vary based on model differences

Pubs faced a major economic shock during Covid, and pressures have continued with inflation in COGS, wages & energy putting strain on pub viability

- Pubs hit by lockdown closures, additional costs to make pubs 'Covid-safe' on reopening, plus expanding and adapting their outdoor space during Covid.
- Differential pub volume rebound following reopening some sites benefitted from staycation boom, while others remained hit by changing footfall patterns in city centre locations, and changing consumer drinks preferences prompted by lockdown.
- Economic pressures have continued post-Covid with inflation in raw materials, wages and energy putting severe strain on viability of pubs.
 - **Energy** was the #1 issue with those out of contract facing ~2x higher prices. This has come down, slightly, but remains double pre-Covid levels, wiping out annual profit.
 - COGS increases driven by higher costs passed on by brewers, plus further increases of up to 20% for food.
 - **Labour** costs up to 10% higher, as pay rates have risen including impact of higher NLW; although variation, reflecting local labour markets around a pub (shortages more acute in some locations than others). Expect this to continue to rise above inflation*.
- Further costs faced by pubs include investment to help achieve Net Zero and other sustainability targets; business rate increases – particularly when the rate relief ends in 2024; and rent increases – implemented as contracts expire.
- As with brewers, timing, magnitude, and persistence of the impact on specific firms varies given different contract positions, levels of hedging and forward purchasing.





Despite energy costs coming down from August 2022 peak, pubs still face 2-3x higher energy prices now gov support has ended.



NLW has pushed labour costs up by ~30% since 2019 with further rises expected next year





Up to 20% higher food COGS still persisting as raw material & energy prices increase supplier costs

To deal with higher costs, pubs are increasing prices for customers and redesigning menus

Vast majority of pub costs go on food & drink COGS and people, then tail of other op costs

- The cost profile (mix) is broadly similar across pubs, although model differences can affect the mix these include:
 - (i) Food-led earning higher gross margin to pay chefs than wet-led (operating margin similar); (ii) Smaller pubs often operate with fewer people and so lower share of sales on labour; (iii) Leased & tenanted pubs pay rent to pub company, typically around half of profit pre rent but can range from 35-65%.

Pubs face cost increases of up to 43% – sets scale of challenge to mitigate, pass-through or absorb.

- Focus on changes to improve labour and energy efficiency, including (for some)
 decisions previously thought off limits, such as reduced pub opening hours or
 stopping food sales to save on people and energy costs.
- Scale of impacts can't be offset entirely by operating cost savings or absorbed in margin – pubs are having to pass-through in higher prices. The av. price of a pint has increased 12% YOY as a result, and pubs also redesigning menus – replacing ingredients (e.g. cod to 'white fish') & smaller portions ('shrinkflation').
- Furthermore, there are additional costs on the horizon for businesses currently receiving government support e.g. existing rate relief – due to end in April 2024.

Illustrative pub cost	2019 % sales (gross)	С	2024	
Base *		Actual 2019 v '23	Forecast 2023 v '24	% sales (gross)
COGS - drink	15%	15%	10%	19%
COGS - food	23%	30%	10%	33%
Wages	28%	30%	10%	40%
Utilities	4%	120%	-10%	8%
Repairs & renewals	1%	40%	5%	1%
Marketing & rents	1%	25%	2%	1%
Other operating costs	6%	30%	10%	9%
Combined cost p	+32%	Additional +8%	+43%	

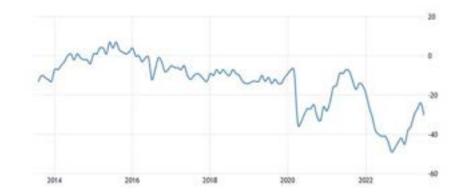
Highlights scale of cost pressure – to absorb, mitigate or pass-through. Recent price inflation reflect that some of these cost pressures have started to be passed through – Though not entirely due to greater scope to mitigate (e.g. menu changes) and limitations on consumer willingness / ability to pay (cost of living).

Specific pub impacts will vary based on model differences

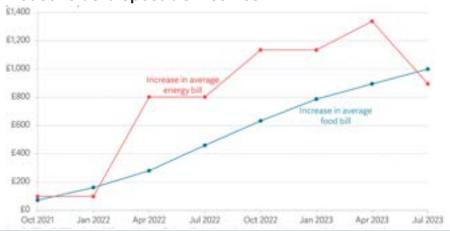
The pub sector is also particularly exposed to the consumer cost of living crisis...

- Households face serious cost of living pressures with surging inflation higher energy bills, food and fuel prices, and higher mortgage / debt repayments linked to rising interest rates.
 - Having plateaued close to 40-year highs in Autumn 2022, inflation has started to fall, largely driven by energy costs retreating from their peak.
 - However, the average energy bills will still be more than 60% higher than in winter 2021/22 and support for energy bills has finished. Meanwhile food inflation continues to rise such that the increase in food bills since 2019-20 are now larger than that for energy.
- Pubs & brewers flagged reduced consumer demand as a concern. As finances are stretched, consumers typically cut back most on discretionary spending such as pub visits.
 - Recent CGA survey (July 2023) found 35% of consumers were going out less frequently because of cost of living / inflationary concerns and 35% said they would eat and drink out less frequently next month.
- Some pubs will be more exposed to spending cutbacks than others, depending on the nature of the pressure on households and the proposition focus of the pub.
 - For example, some upmarket pubs may be more protected as their consumers cutback less than midmarket, whose consumers are more exposed; or wet-led pubs may see more resilient demand than food-led pubs, given relative cost of a drink vs a meal out.

Sharp fall in consumer confidence which despite improving slightly since record lows last year remains at pandemic levels



...and rising household bills (not just from energy) squeezing households' disposable incomes



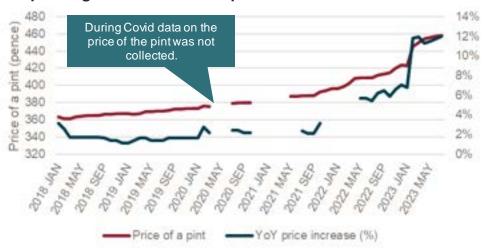
Sources: The GfK Consumer Confidence indicator, Trading Economics; Resolution Foundation

...therefore pubs have tried to delay price increases where possible, working to mitigate and absorb increases temporarily before passing them through this year

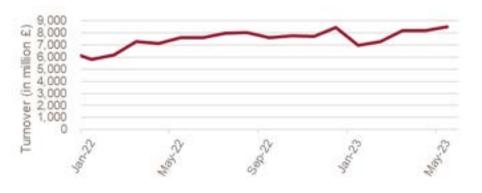
Despite initially absorbing some costs, pubs have now passed most the cost increases through to consumers. This has not resulted in an uptick in revenues as demand falters.

- Overall UK inflation began to increase rapidly at the end of 2021 and peaked in October 2022, but took time to come through in pub prices.
 - In October 2022 inflation on a pint was +5.9%, well below level of cost pressures faced by pubs according to interviewees. By July 2023, following 6 months of double digit inflation, inflation on a pint was almost 12% YOY.
- Some of this delay is because of contracts and hedging not all pubs were immediately exposed to the cost increases.
- In addition many pubs refrained from immediately passing on the costs to customers in part due to a worry that consumers would be unable to afford, or given its discretionary nature, unwilling to pay significantly higher prices.
- Pubs worked to mitigate cost pressures many reformulated menus to reduce cost (smaller portions, cheaper ingredients) or changed opening hours to reduce energy & labour costs at times of low demand. Some pubs also absorbed higher costs in margin.
- As prices have risen further, pubs have noticed a fall in the frequency and spend of customers. For example, wet-led pubs are mostly seeing individuals getting one less pint when visiting (~33% decrease); and food-led pubs are experiencing a decline in the number of people eating out and when they do, they often cut back on what they eat.

Despite large increases in the price of beer at the start of 2023...



... Turnover of food and beverages has remained fairly constant



Source: ONS price of a pint; BBPA Digital Handbook - C12

The impacts are likely to be larger and harder to navigate for independent pubs and brewers and smaller pub chains

- This report is largely based on data and interviews with larger firms. These firms will have some knowledge of the impact on smaller firms which we are able to combine with self-reported impacts in surveys.
- A survey of 300 sector businesses in Q3 2023 found that smaller pubs and independents are much more likely to be pessimistic about the prospects of the market as a whole and their own business over the next 12 months.
- While larger firms are more likely to have financial reserves to draw on, this is often less true for smaller firms and independents who are much less likely to have a year's cash reserves.
- Therefore they are more exposed to the economic shocks and have been particularly reliant on the support from government.
- Similarly, it is more challenging for smaller pubs and breweries to invest in efficiency saving equipment. Thereby making it harder to mitigate the cost increases.

Particularly difficult challenges for smaller pubs and brewers

Limited financial reserves

Limited resources to invest in technology upgrades

Limited scope to scale supply due to high fixed brewery costs

Limited administrative resource for scheme compliance (e.g. DRS, EPR)

Limited bargaining power

Greater reliance on debt in a high interest environment

Contents

Topic

Summary

Supporting detail: Economic environment facing pubs & brewers

Annex 1: Landscape of pubs and brewers in the UK

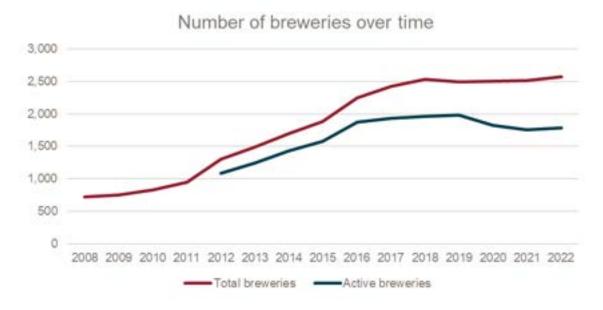
Annex 2: Economic model of pubs and brewers

Annex 3: Current economic impact on pubs and brewers

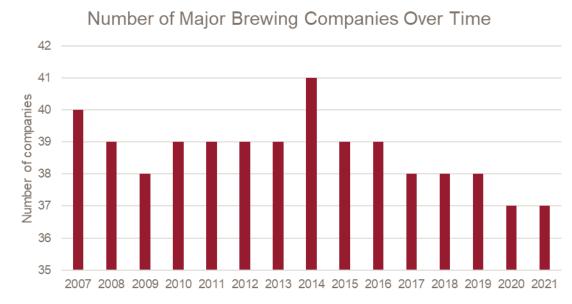
Annex 4: Methodology and interview findings

Number of breweries in the UK

Big increase in number of breweries in the last 10 years – driven by microbreweries. However since Covid there has been a fall in the number of active breweries.



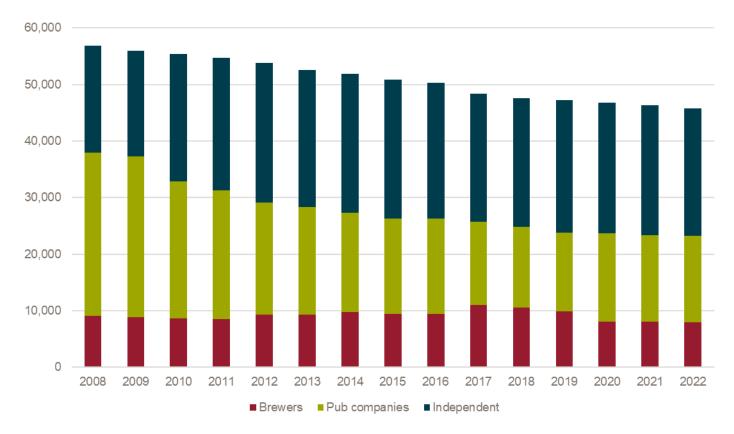
There has been a slight reduction in the number of major brewery companies operating in the UK over the last 6 years.



Source: BBPA- Digital Handbook E6 (2021) Note: 'major brewing company' defined as breweries established before 31st December 1970 and other major breweries as defined by BBPA in E7 of the Digital Handbook.

Number of pubs in the UK

Pub numbers have continuously fallen over the last 15 years. Most of this appears to be a reduction in the number of pubco-owned pubs – 50% of pubs are now independent.



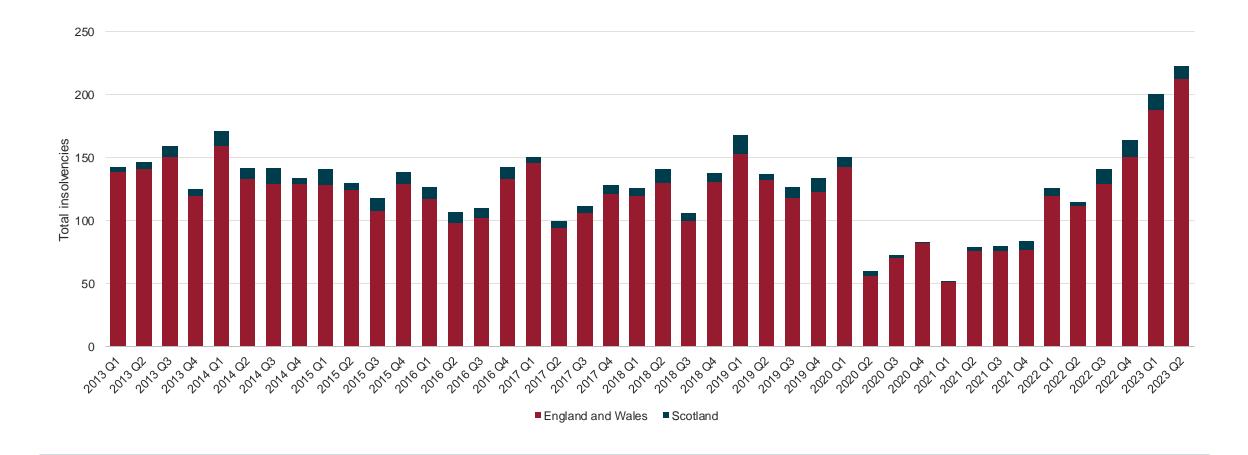
Continuous steady fall in number of pubs since 1990, the rate of pub closures has accelerated in recent years before slowing during the pandemic while support was in place.

Period	# pubs at start	# pubs at end	Closures	Closures per year
1990 - 2000	63,500	60,800	2,700	245
2000 - 2008	60,800	56,900	3,900	488
2008 - 2012 (financial crash)	56,900	53,800	3,100	775
2012 - 2020 (Pre pandemic)	53,800	46,800	7,000	875
2020-2022 (Pandemic onw ards)	46,800	45,800	1,000	500

Source:: BBPA- Digital Handbook E5 (2021)

Pub insolvencies

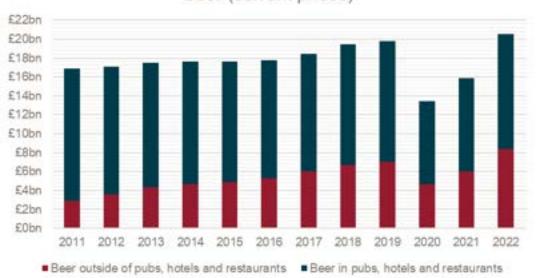
Pub insolvencies have risen following a period when suppressed due to government support – up 76% in H1 2023



Spending on beer

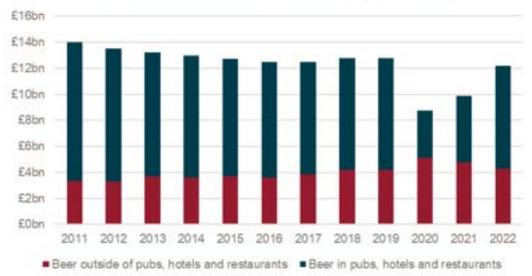
UK households' total consumption expenditure on beer reached a new peak in 2022 after a significant drop during the pandemic...

UK household total consumption expenditure on beer (current prices)



...However, in real terms, UK household consumption expenditure on beer fell significantly during the pandemic and, despite recovering in 2022, is still more than £600m lower than it was in 2019

UK household total consumption expenditure on beer (Chained volume, reference year 2006)



Source: Frontier analysis based on BBPA- Digital Handbook C2 & C4 (2021)

Source: Frontier analysis based on BBPA- Digital Handbook C3 & C5 (2021)

The beer and pub sector is an important part of the UK economy, and UK society more generally

- Over 46k pubs in the UK, and over 1,800 active breweries in the UK. Vibrant and changing sector –the total number of pubs has been in steady decline since early 2000s; but rapid growth in number of microbreweries, and innovation in craft and no / low alcohol beer to meet changing habits.
- Overall beer and pub activity estimated to sustain 936k jobs, £14.3bn of wages and £26.2bn of GVA across the UK from direct, indirect and induced effects with a significant contribution in every region of the UK, reflecting pub locations.
- The sector generates over £15bn in tax revenue including £6.5bn in VAT (~5% of total receipts), £4.6bn in excise duty, £2.3bn in income tax/NICs and £1bn in corporation tax.
- The bulk of the contribution comes from pubs at the heart of communities across the UK, serving residents & visitors, supporting jobs, and delivering social value through bringing people together and delivering social impact projects and beer plays a key role in pubs. No/low alcohol beer also plays a role in improving health outcomes.
- Pubs support jobs for the young, and those looking for flexible work nearly half of those employed in pub sector are under 25, and over half are part time.
- The sector's direct GVA contribution (£13.8bn) is estimated to be larger than, for example: the manufacture of motor vehicles; air transport; and motion picture, video and TV production.
- Spending in pubs plus off-trade beer sales are a meaningful share of consumer spending; total spent on beer (£13bn) equates to 1.1% of all consumer spending.

46K

Pubs in the UK

1.8K

Active brewers in the UK

936_K

Jobs sustained

£26BN

GVA, across the UK

£15BN

Tax revenue generated

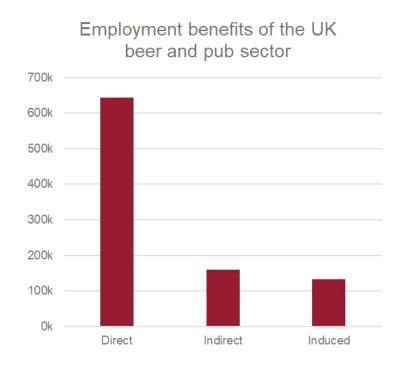
Sources: BBPA digital handbook (2021) – E5, E6, E11, E12; Oxford Economics Report for BBPA ('The Local Impact of The UK Beer and Pub Sector')

frontier economics

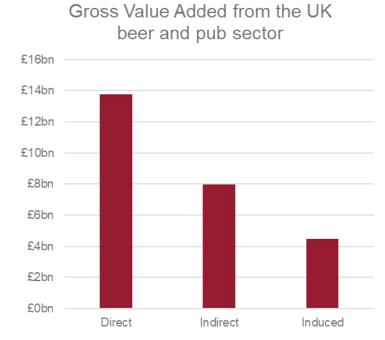
21

Beer and pub sector's contribution to the UK economy (1/2)

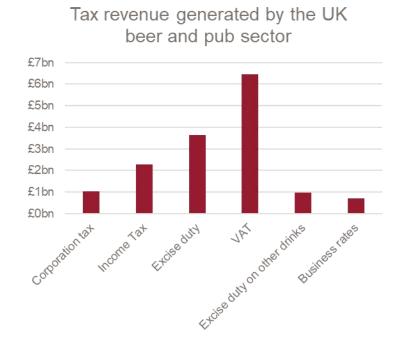
Almost 1 million people are employed as a result of the beer and pub sector



The sector is estimated to have generated £26.2bn in GVA



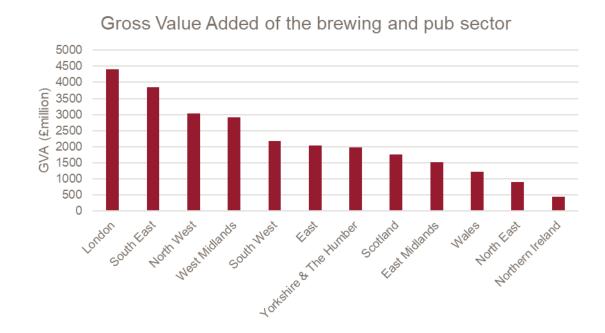
The sector is estimated to have generated £15.1bn in total taxes



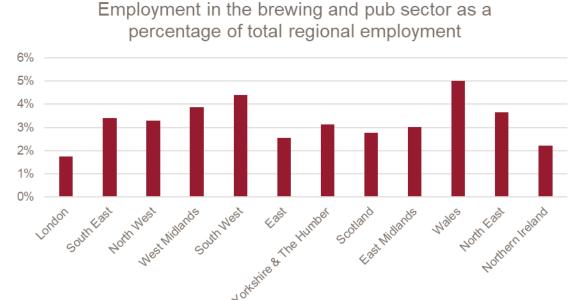
Source: Oxford Economics Report ('The Local Impact of The UK Beer and Pub Sector') based on data from ONS, NISRA, BBPA and Oxford Economics (2021)

Beer and pub sector's contribution to the UK economy (2/2)

The sector's economic contribution is spread across all regions of the UK



Employment in the brewing and pub sector makes a larger proportionate contribution to regions outside of London, such as in Wales and the West Midlands.



Source: BBPA digital handbook- E11 (2019)

Source: Frontier analysis based on ONS data and BBPA digital handbook- E12 (2019)

Previous reports have highlighted the 'social value' of the beer and pub sector, in addition to its economic value

The Social Value of Pubs and Publicans Providing Services in their Communities (2020)¹

Pubs offer local solutions and projects that achieve social policy priorities and have a large social impact for a relatively low-cost investment.

Pubs offer a collective resource to help tackle challenges such as an ageing population, the reduction of rural services and isolation and loneliness issues.

64% think that a pub is a main place local people can socialise.

86% think the whole community suffers when a local pub closes.

£1 spent on a project through the Pub is The Hub Community Services Fund, created £8.98 - £9.24 of social value.

Unlocking the socio-economic potential of our nation's pubs (2023)²

Pubs are vital social infrastructure pillars for communities across the UK. A visit to their local pub is an opportunity to socialise with neighbours and friends and gives a sense of belonging to various groups - helping prevent social isolation and loneliness.

81% of British adults said pubs are important in bringing people together and 68% felt that pubs help combat loneliness in their local area.

The permanent closure of rural pubs could threaten the social fabric of many communities.

The State of our Social Fabric (2021)³

Certain types of physical infrastructure – especially local hubs that bring people together, such as pubs – are particularly important in improving the social fabric of a place.

The bottom decile for social fabric saw a 37% decline in the number of pubs per capita since 2001, compared to a 29% decline for the top decile of areas.

53% think that there is a responsibility to protect local institutions such as pubs and post offices from closure.

Open Arms – The Role of pubs in tackling loneliness (2021)⁴

Pubs have an important social function in providing a space for different forms and levels of social interaction (from making new friends, to meeting up with friends and family).

Pubs also organise a range of activities and events which bring people together.

WHO Global Strategy to Reduce the Harmful Use of alcohol (2020)⁵

Increased consumption of low / no alcohol beer can improve health outcomes as consumers switch from higher alcohol products.

Contents

Topic

Summary

Supporting detail: Economic environment facing pubs & brewers

Annex 1: Landscape of pubs and brewers in the UK

Annex 2: Economic model of pubs and brewers

Annex 3: Current economic impact on pubs and brewers

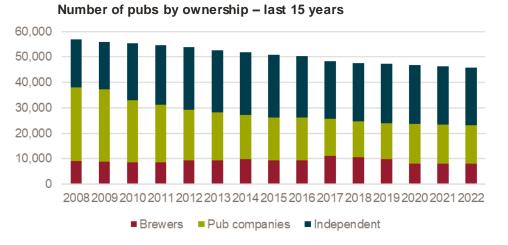
Annex 4: Methodology and interview findings

There is a diverse mix of pub & brewer business models...

- UK brewing sector is highly competitive by international standards all main operators are present, unlike most other markets, with limited consolidation – even with a high duty rate.
 - Brewers range from scale of global brewers alongside a regional & craft scene, with a tail of microbreweries. Largest nine breweries account for c.90% of UK volume, while the tail of 1,800 account for just 2% of volume.
- Pub sector includes large & small chains, plus independents with mix of op models.
 - Half of pubs are independent, ~30% owned by pubcos, and remaining ~20% by brewers. 80% of pubs are SMEs – all independent and L&T pubs.
 - ~30% of pubs are 'leased & tenanted' (L&T), where an individual rents the pub from a pubco / brewer for an agreed period; and ~20% are 'managed' by someone who works for pubco / brewer (both pubcos and brewers operate a mix of op models).
 - Pubs vary in their proposition focus between 'wet' and food-led, whilst some also offer accommodation. There has been a steady decline in share of 'wet' sales over the last 15 years as food sales have increased.
 - Long run decline in number of pubs over last 30 years, accelerated since 2001. Number of independent and brewer-owned pubs broadly stable over the last decade, but number of pubco-owned has nearly halved as marginal sites closed.

Number of breweries – last 15 years 2500 2000 1500 1000 500 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021

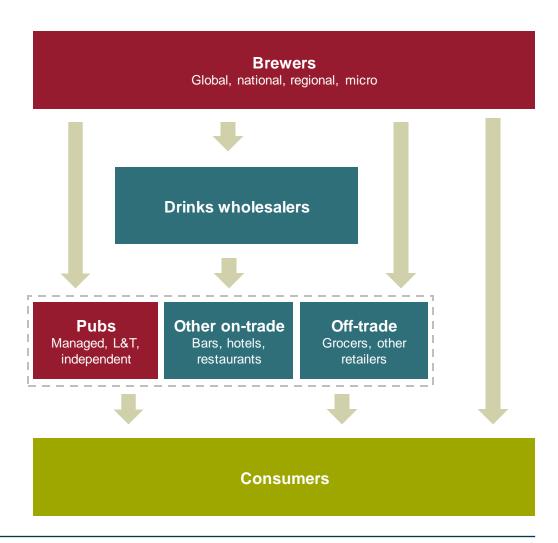
Total breweries ——Active breweries



Sources: BBPA digital handbook (2021) - E5 and E6.

...and a symbiotic relationship between the two groups

- Brewers and pubs have a 'vertical' relationship. The extent of the links vary, from simple supply relationships (all pubs buy from brewers; all brewers sell to pubs), to partnerships, to vertically integrated firms who operate both pubs and breweries.
 - 1 in 4 brewers own pubs more for the mid-size, where regional firms often operate both a brewery and pubs in the area.
 - ~40% of total brewery volumes go to on-trade, down from ~50% in mid 2010s as the share of sales through the off-trade has increased.
 - Smaller brewers typically have a higher share of sales to on-trade, while larger brewers have higher share to off-trade.
- Brewers employ sales teams to manage sales to the on and off-trade on-trade sales teams are typically larger given less consolidated customer Base than off-trade; but some use drinks wholesalers to manage this interaction instead.
- Brewers typically earn higher margins on their sales to the independent pub sector compared to sales to larger pubcos and the off-trade, where higher countervailing buyer power and larger volumes lead to lower average margins for brewers.
- Some brewers sell direct to consumers, typically online, but some also operate their own retail stores.



27

The economic model of a pub and a brewery affects their exposure to and ability to mitigate shocks – there are common themes, and some model differences

It is important to understand the economic models of brewers and pubs to understand their exposure to current economic shocks, ability to mitigate, and potential ways in which policy can support

Brewers

Common themes

- Production business raw material commodity inputs
- Automated production, more people intensive sales
- Low margin business
- High duty rates- some of the highest in the world
- High level of fixed costs economics rely on high utilisation

Model differences

- Size unlock economies of scale
- Level of vertical integration with pubs
- On / off-trade sales mix, and size of sales force
- Insource vs outsourced activities
- Extent of contract brewing

Pubs

Common themes

- Economics revolve around individual sites (even if part of wider group)
- Food & drink the core COGS items
- People focussed business customers & labour
- Discretionary spend, exposed to changes in demand
- Requires periodic pub refresh (capex spend)

Model differences

- Ownership / level of vertical integration with brewers
- Operating model managed vs L&T vs independent
- Proposition focus food, wet, accommodation
- Size, location type & customer profile

For a brewery, revenues need to cover ingredients, manufacturing & distribution – plus allow for investment in brand building, brewing facilities & infrastructure

The three main cost categories for brewers are duty, production and sales – with slim margins above those costs

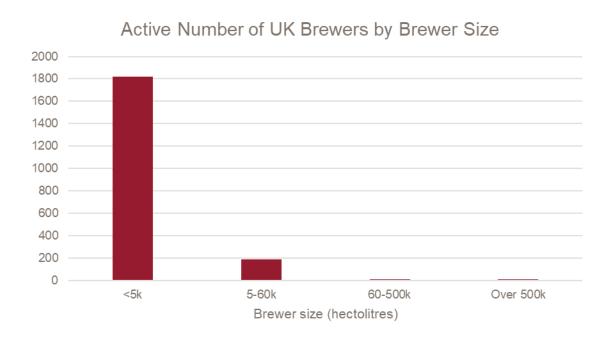
- Duty accounts for a large share of (gross) sales paid by brewers, with cost passed on to consumers via pubs / retailers. Duty rates vary by alcohol strength, which means duty levels can vary across brewers based on their product mix. Small producers relief to reduce the burden for smaller operators.
- **Production** costs account for around half of total costs (ex duty) of which raw materials (malt, hops, sugars, yeast) are the bulk, followed by energy & labour (brewers are not particularly labour intensive).
 - The cost of production is similar across beers 'premium' beers generally do not cost more to produce, but the retail price differential comes through a brand premium supported by additional costs of brand building and positioning, inc packaging for off-trade and glasses & pumps in on-trade.
 - Larger brewers produce at significantly lower cost per hl reflecting scale economies. Efficient
 operations rely on high asset utilisation to spread fixed cost of operation, and optimised logistics.
- Sales & admin account for around a third of cost Base, with further costs for distribution & warehousing, and packaging.
- The cost profile (mix) is broadly similar across brewers, although model differences can affect the mix these include on/off-trade mix (which affects packaging), extent of outsourced activity (e.g. logistics), and contract brewing (which has production costs but no sales/marketing costs).
- Capex focusses on manufacturing kit, which does not need regular updates. Sector as a whole averages annual capex of 3.9% of sales or £243k per business.

Illustrative brewer P&L - 2019	% sales (gross)
Duty	40%
Production	28%
- Raw materials	14%
- Energy & water	5%
- Labour (production)	5%
- Other production	4%
Distribution & warehousing	6%
Sales & admin	20%
Packaging	2%
Margin	3%

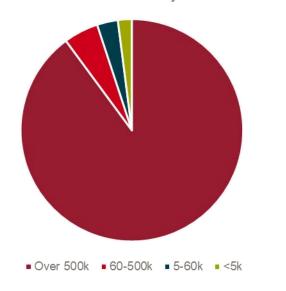
Source: Frontier analysis based on BBPA input and BBPA member data

Brewers - variation in size

There are a very small number of large brewers that account for a very large share of the market (9 brewers account for almost 90% and 23 brewers account for almost 95% of UK volume with a very long tail of microbreweries)



Share of Beer Market by Brewer Size



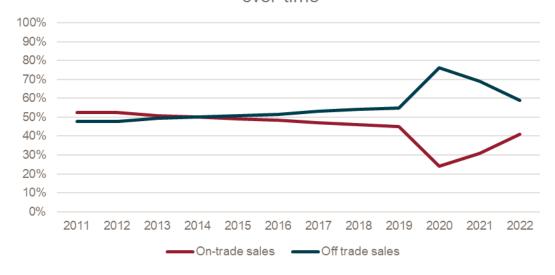
Source: The number of brewers is based on 2021 BBPA data. The distribution of these brewers by size is based on 2019 sales volume of BBPA members, HMRC small brewer volumes, and the Brewery Manual.

Source: BBPA data based on 2019 sales volume of BBPA members, HMRC small brewer volumes, and the Brewery Manual $\,$.

Brewers – on / off-trade mix

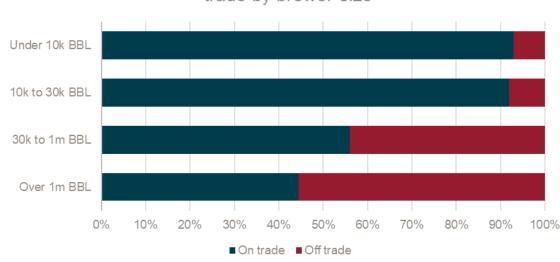
There has been a steady shift from on-trade to off-trade over the last 10 years, which then spiked due to Covid closures to on-trade





Larger brewers are more likely to sell a higher proportion of their beer to the offtrade

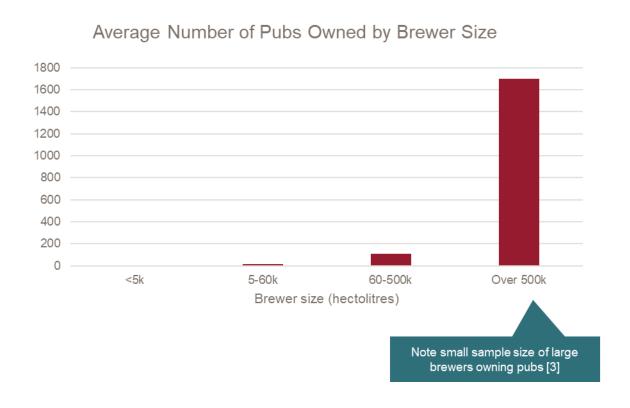


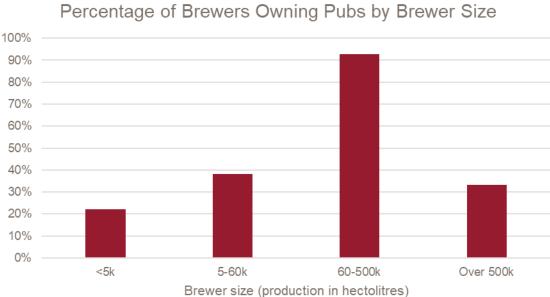


Source BBPA Digital Handbook-A6 (2022) and Frontier Analysis using BBPA member data (2019). Note the two charts are based on different data sources hence some differences.

Brewers – extent of pub ownership

Brewers of all sizes own pubs but the very largest brewers own significant quantities of pubs





Source: The size of brewers is based on 2019 sales volume of BBPA members, HMRC small brewer volumes, and the Brewery Manual. The number of pubs owned is based on 2021 BBPA data.

Brewers – differences in P&L shape (1/2)

Larger brewers enjoy significant economies of scale but cost profile is similar...

Illustrative cost structure	Small (5khl)	Mid-size (60khl)	Large (500khl)
Total cost per hl	£86	£58	£33
Share of costs:			
Production	49%	39%	51%
- Raw materials	19%	17%	25%
- Energy & water	7%	6%	9%
- Labour (production)	10%	6%	9%
- Other production	13%	9%	7%
Distribution & warehousing	14%	17%	11%
Sales & admin	32%	38%	36%
Packaging	5%	6%	3%

Brewers – differences in P&L shape (2/2)

...while brewer model choices will affect P&L shape (plus duty relief from small brewers)

On / off-trade mix

Brewers with a higher off-trade share will have higher share of costs on packaging (for cans, bottles) than those who only sell to on-trade.

Beer ABV

Higher strength beers incur higher duty / lower strength lower duty, so differences in brewery mix will affect duty

Activities performed in house (e.g. packaging, logistics)

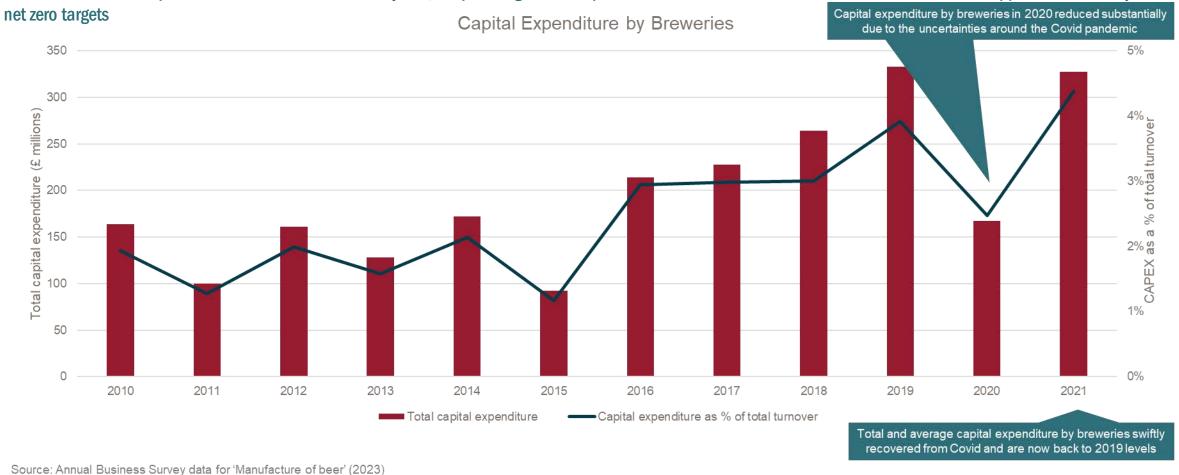
Differences in P&L shape, but ultimately cost will be borne somewhere in P&L (e.g. *Insource*: will pay capex for packaging / logistics then depreciate / maintain plus ongoing opex; *Outsource*: no capex / depreciation / maintenance, but higher ongoing opex)

Contract vs own brewing mix

Contract brewing face same production / distribution costs (and may support scale economies) but no marketing

Brewers - Capital expenditure





For a pub, revenues have to cover cost of goods (from breweries, plus other drink & food), people & operating costs – and allow for investment in buildings & environment

Vast majority of pub costs go on food & drink COGS and people, then tail of other op costs

- Food & drink COGS are ~40% of sales for a typical pub. People costs at ~25% sales, with high share of staff paid at NLW (so directly exposed to increases). Utilities and rates are each ~4% sales (pre-energy-price surge); other costs which include marketing, entertainment, maintenance add up to 7-10% sales.
- The cost profile (mix) is broadly similar across pubs, although model differences can affect the mix – these include: food vs wet-led; size; ownership; and accommodation.
 - Food-led pubs earn higher gross margin to pay higher cost of chefs, but op margin not substantially different to wet-led.
 - Smaller pubs often operate with fewer people, and lower share of sales on labour.
 Larger managed pubs (av 2.5x higher average turnover) operate with bigger teams.
 - Leased & tenanted pubs pay rent to pub company, typically around half of profit pre rent but can range from 35-65%.
 - Accommodation supports site profitability, but requires the right site & capital to furnish.
- Pub capex focusses on pub fit out and upkeep, which typically requires update every ~7 years although cycle varies across operators. Sector average capex is 7.4% sales or £47k per business (increased to £65k in 2020 due to Covid measures).

Simplified P&L, 2021 – Leased & tenanted - 2019	Wet-led	Food-led
COGS - drink	35%	15%
COGS - food	8%	23%
Gross Profit	57%	62%
- Drink	56%	57%
- Food	61%	65%
Wages	23%	28%
Utilities	4%	4%
Rates	3%	4%
Repairs & renewals	1%	1%
Marketing & entertainment	4%	1%
Other operating costs	5%	5%
Profit before rent	18%	18%
Rent (to pubco)	9%	9%
Profit after rent	9%	9%

Source: Frontier analysis based on "running a pub guide" 2022 and 2019, BBPA member data 2019 – 2022 and interviews

Pubs – Differences in P&L shape

The cost profile of pubs is broadly similar but model choices will affect P&L shape

wnershi	
THE OFFICE	
14.44 BY - 1 M - 4 BY	
	•

Pubs owned by larger pub companies or brewers typically have lower COGS compared to independents due to better buying terms.

In addition to supporting their own managed pubs, larger owners often co-invest in capex for their L&T pubs, and support L&T pubs during tough times (e.g. waiving rent in Covid).

Larger pub companies did not receive the same level of government support during Covid. This is because Local Authority support grants and rates relief were subject to State Aid rules and caps which are applied to businesses rather than individual premises.

Operating model

Managed pubs are typically larger and more people intensive operations – labour is typically a higher share of sales, and other operating costs are a lower share of sales compared to smaller L&T and independent pubs.

Leased pubs tend to be rented for a longer time than tenanted pubs so more inclined to invest in capex.

L&T pub rents are typically negotiated as share of profits. Whereas managed and independent pubs will either be owned outright or will pay market rents to the freeholder.

As with larger pub companies, managed pubs did not receive the same level of government support during Covid.

Proposition focus

Food-led pubs earn higher gross margin to fund higher wage costs of chefs and waiting staff. Wet-led pubs have a lower gross margin but lower wage costs hence profit margin is similar.

Accommodation-led pubs generate additional profit streams from the site.

Size

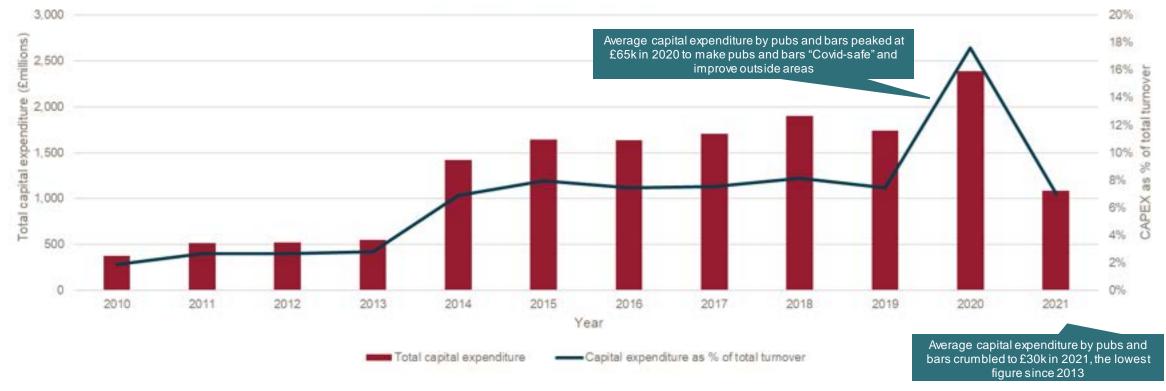
Some economies of scale for larger pubs to spread more "fixed" operating costs (e.g. utilities and entertainment).

Larger pubs are more people intensive, therefore labour is a higher share of sales.

Pubs - Capital expenditure

Total pub capex increased since 2014, prompted by the end of the "duty escalator" and an increased focus on pub refresh to meet customer demands (e.g. improving interiors). Covid prompted sharp increase to meet "Covid-safe" requirements and improve outside areas (~£18k per pub at a total cost to the sector of £643m). As with brewers, current economic pressures risk cuts to capex spend





Source: Annual Business Survey data for 'Beverage serving activities' (2023)

Contents

Topic

Summary

Supporting detail: Economic environment facing pubs & brewers

Annex 1: Landscape of pubs and brewers in the UK

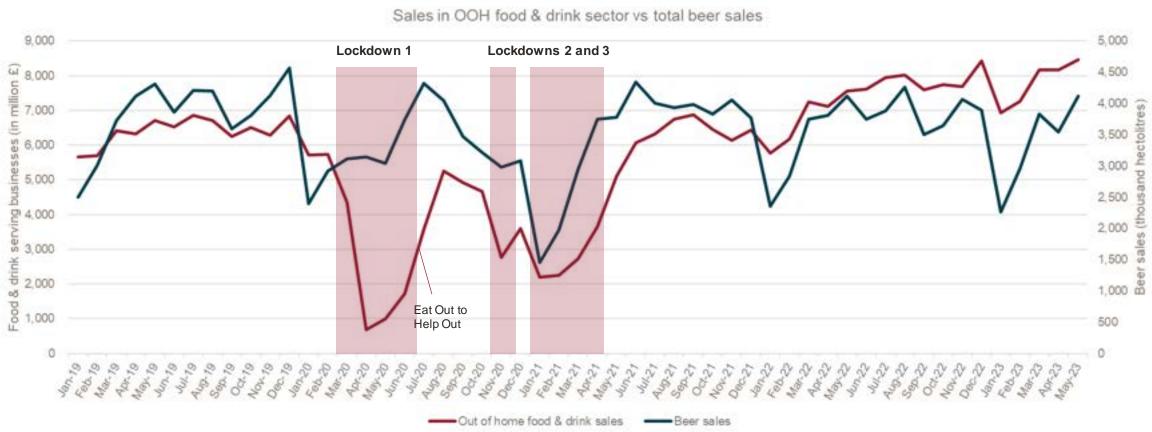
Annex 2: Economic model of pubs and brewers

Annex 3: Current economic impact on pubs and brewers

Annex 4: Methodology and interview findings

Impact of Covid on sales

The entire food and beverages service sector, of which pubs are a key part, was particularly hard hit by the lockdowns but has now recovered. Total beer volumes also down in each of the three lockdowns, and remained below pre-Covid levels during the rest of 2020/21, but benefited from ability to shift to off-trade and are on track to recover



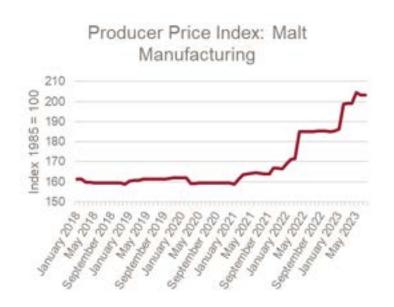
Source: BBPA Digital Handbook-A2 and C12 (2023) and Institute for Government (2021)

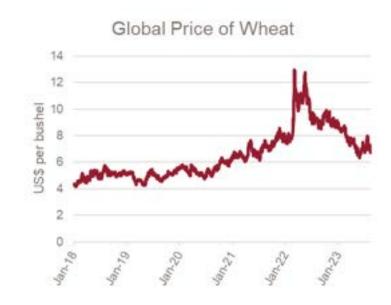
Prices of key commodity inputs

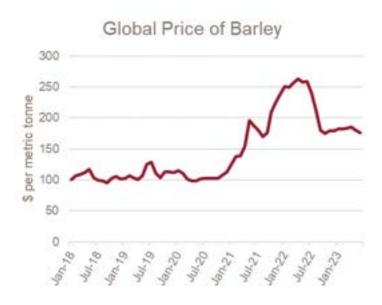
The global price of malt has increased by 28% since the beginning of 2021. It has continued to grow throughout 2023

The global price of wheat peaked in March 2022 at a 101.6% increase. It has since fallen back to just a 6% rise on January 2021

The global price of barley peaked in April 2022 at 109% increase since the beginning of 2021. It has since dropped back slightly to 40% higher than 2021







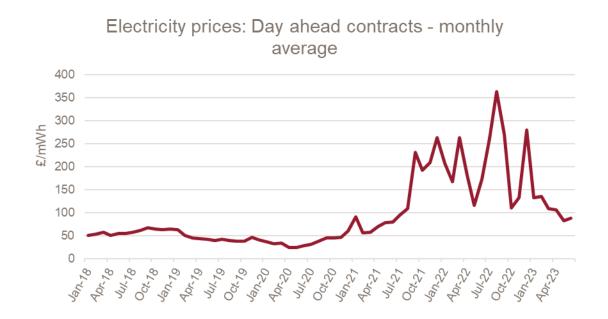
Source: Federal Reserve Economic Data (August 2023)

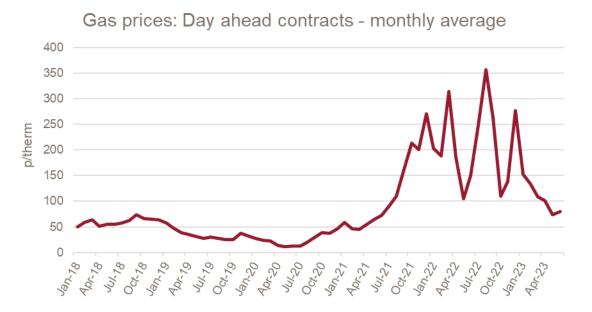
Source: Macrotrends (August 2023)

Source: Federal Reserve Economic Data (August 2023)

Average wholesale energy prices

After peaking in July 2022, wholesale energy costs are now falling. The price of electricity and gas in the UK has decreased, as of June 2023, by \sim 49% and \sim 46% relative to the same month of the previous year but is still \sim 100% and \sim 132% higher than pre-Covid levels (computed as an average across 2019)



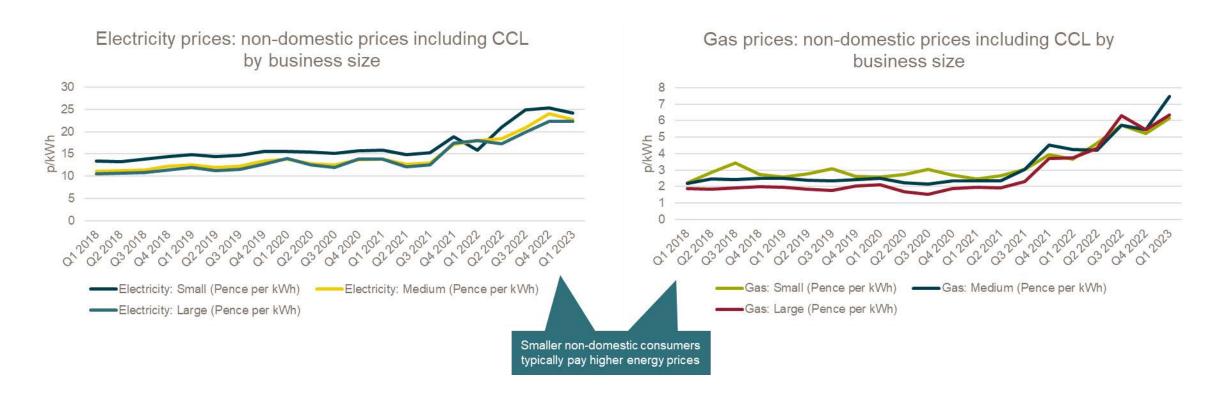


Source: Ofgem (August 2023)

Source: Ofgem (August 2023)

Average energy prices paid by businesses

The way electricity and gas prices feed through to the prices that businesses pay depends on contracts and hedging in place. Electricity and gas prices paid by non-domestic consumers in the UK in Q1 2023 were 60% and 136% higher, respectively, than their 2021 average



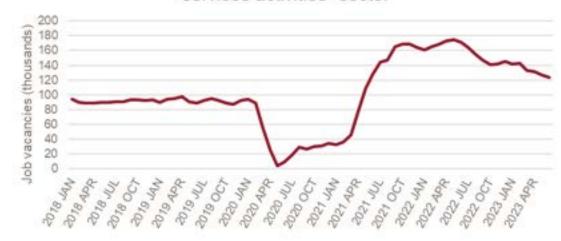
Source: Ofgem (August 2023)

Source: Ofgem (August 2023)

Labour market

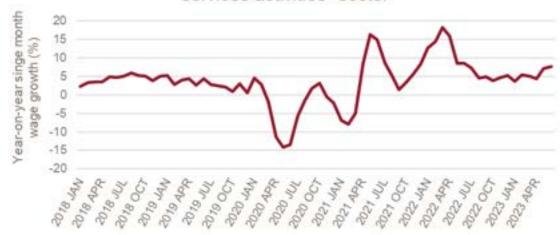
Following the end of lockdowns, job vacancies rose quickly, peaking at almost double the pre pandemic levels. Since May 2022, vacancies have started to fall

Job vacancies in the "accommodation and food services activities" sector



The shortage of labour, the cost of living crisis and the national living wage, is causing significant wage inflation, which is now slowing down after peaking between April 2021 and April 2022

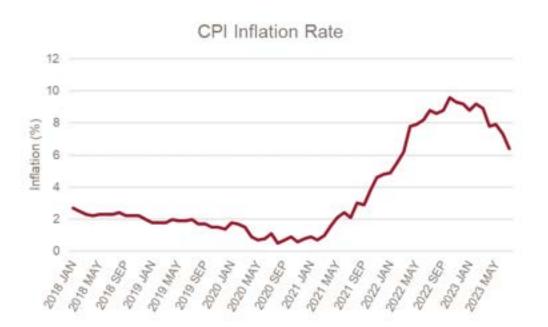
Wage growth in the "accommodation and food services activities" sector



Source: ONS (August 2023)

Measures of inflation

CPI has been consistently below 3% for many years. Since 2021 it has rapidly risen to around 10% at the start of 2023. It has dropped back slightly in recent months



Food-led pubs are experiencing increases in the cost of food. Meat and dairy prices have started to fall, however they are still 7% and 3% higher than they were in 2021, respectively



Source: ONS (August 2023)

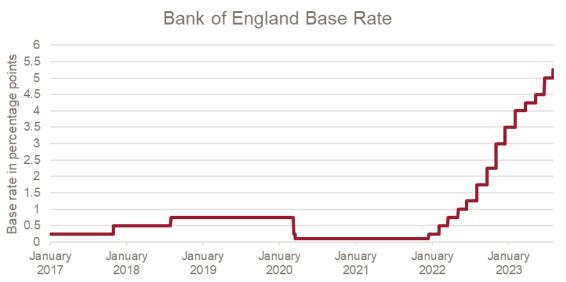
Source: FAO Food Price Index (August 2023)

Exchange rate and base rate

The continuous devaluation of the pound against the dollar over 2021 and 2022 has further compounded inflationary pressures. This has reversed somewhat during 2023

The Bank of England Base rate has been steadily increased with view to dampen soaring inflation





Source: Macrotrends (August 2023)

Source: Bank of England (August 2023)

Alcohol Duty: With the exception of draught, Duty is increasing by 10.1% - this needs to be passed through potentially impacting consumer demand

What is alcohol duty?

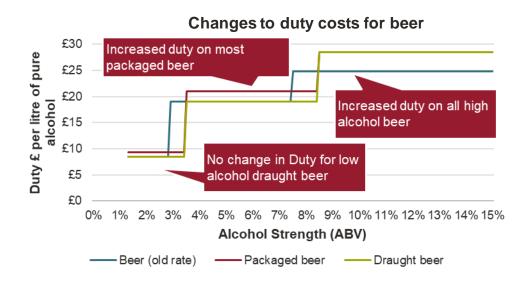
• Alcohol duty is a tax charged at the point of production or importation of drinks of alcoholic strength exceeding 1.2% alcohol by volume. The principle of the duty system is that stronger products (with a higher ABV) will pay a higher rate of alcohol duty, though some exceptions apply.

How and why are duty rates changing?

- The standard rate of duty on packaged beer between 3.5% ABV and 7.5% ABV will rise by 10.1%. However, draught beer and cider products are protected by a 9.2% discount offered on items in 20ltr containers that are less than 8.5% and use a dispense system, meaning that, for example, the duty on a 50ltr 4% lager will not change.
- Small producers of alcoholic products may be entitled to a lower rate of duty.

What is the expected impact?

- Despite being charged at the point of production, duty is almost always passed onto the consumer.
- Therefore the main impact is that consumers will see the price they pay increase. For a 24 pack of 330ml 4.5% larger, the price will increase by £0.69 per case.
- This could cause a reduction in demand given the cost of living crisis (see slide 13) increasing elasticity.
- Some companies are also looking to reduce the alcohol strength of their products below the 3.5% threshold of higher duty. Although this goes against the premiumisation trend used to increase the price of beer.



National Living Wage: Recent increases have and continue to significantly contribute to rising labour costs

What is the National Living Wage?

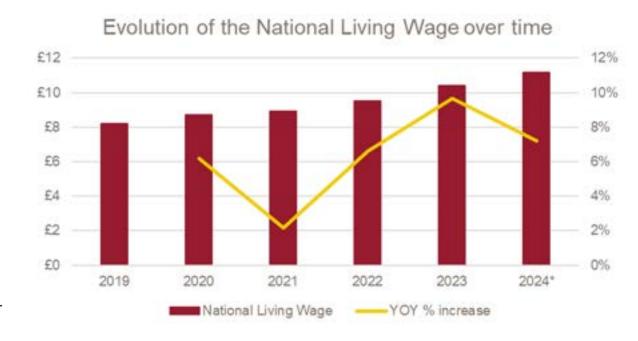
The National Living Wage (NLW) is the minimum hourly rate for people aged 23 and over.

What is happening to the National Living Wage?

- The NLW increased by 9.7% in April 2023, from £9.50 to £10.42. Further increases of between 4.6% and 9.7% are expected in April 2024.¹
- From April 2024 those aged 21 and 22 are due to become entitled to the NLW – currently entitled to minimum wage.

Impact on pubs and brewers

- A large proportion of staff working in breweries and pubs are paid the NLW so labour costs will rise.^{2.}
- This will trigger further wage increases up the pay scale, albeit with compression.
- As compression in wages occurs, greater competition for labour will occur through non-pay factors such as wider perks, flexibility, location, shift patterns.
- Changes to NLW are subject to policy decisions upcoming general election could influence this.



Source: UK Government. Figures for 2024 are based on a preliminary estimate by the Low Pay Commission assuming the government wants to meet the target of two-thirds of the median hourly pay.

^{1.} The Low Pay Commission estimated that the NLW will need to rise to between £10.90 (+4.6%) and £11.43 (+9.7%) in April 2024 if the government wants to meet the target of two-thirds of the median hourly pay by October 2024.

^{2.} Deutsche Bank Market Research estimate that the Tourism, Hospitality and Leisure sector has the highest proportion of jobs paying the minimum wage, at around 30%.

Business rates: The 'cliff edge' ending of current business rate reliefs in April 2024 could result in a £250m increase in business rate bills for the sector

What are business rates?

- Business rates are charged on most non-domestic properties, including pubs. The business rate relief is a reduction in the business rate bill for some businesses.
- There are many types of business rate relief. The most important ones for pubs and breweries are: (i) the small business rate relief; (ii) the retail, hospitality and leisure relief; and (iii) the supporting small business relief.
- Business rate reliefs, as part of the Autumn 2022 £13.6bn support package, are set to end in April 2024. When the relief ends, pubs will have a £220m increase in bills, which could go up to £257m should business rates increase with inflation.

Small business rate relief

- The small business rate relief is a reduction in the business rate bill for properties with a rateable value below £15,000.
- The bill reduction is 100% if the property's rateable value if £12,000 or less.
- The reduction gradually declines to 0% for properties with a rateable value of £12,001 to £15,000.

The retail, hospitality and leisure relief

- Eligible retail, hospitality and leisure businesses initially received 50% off business rate bills.
- For 2023-24 this has been extended to 75% off up to £110,000 per business.

Supporting small business relief & transition relief

- On 1 April 2023, the Valuation Office Agency (VOA) updated the rateable value of businesses. This revaluation happens every three years.
- Properties are eligible for the supporting small business relief if they lost some or all of the small business relief they
 qualified for as a result of the revaluation.
- For these properties, bills will go up by no more than £600 for the 2023 to 2024 tax year.
- Properties might also be eligible for the transitional relief, which ensures that bill changes are phased in gradually.

The latest inflation figures collected by ONS

On-trade products

Off-trade products

Product	Price in July 2022	Price in July 2023	Annual growth
Cider	£4.28	£4.57	7%
Draught lager	£4.00	£4.31	8%
Draught Premium lager	£4.53	£4.94	9%
Pub hot meal	£10.32	£11.38	10%

Product	Price in July 2022	Price in July 2023	Annual growth
Bottled beer	£1.79	£2	12%
Bottled cider	£2.17	£2.37	9%
Cans of lager (10-24)	£11.48	£12.72	11%
Premium lager (4 bottles)	£5.01	£5.64	13%

Source: ONS: shopping prices comparison tool

Price of a pint

Since January the price of a pint has increased each month by 7-12% YoY to reflect rising costs. This is significantly higher than historical price increases. The average price of a pint as of July 2023 was £4.58, compared to £4.09 a year before.



Source: ONS: RPI Ave price - Draughtlager, per pint

Contents

Topic

Summary

Supporting detail: Economic environment facing pubs & brewers

Annex 1: Landscape of pubs and brewers in the UK

Annex 2: Economic model of pubs and brewers

Annex 3: Current economic impact on pubs and brewers

Annex 4: Methodology

Report is based on input from BBPA, selected BBPA members, and external sources for wider economic context. This update built on last year's findings with the same approach

Received Data from BBPA

2 Conducted interviews with BBPA members 3
Collected
data from
BBPA
members

Sourced external benchmarking data

5
Analysed the qualitative and quantitative data

- We received data from the BBPA, notably including:
 - 2021 and 2022 digital handbook which summarises key monitoring data from a variety of sources. E.g. ONS, HMRC, and BBPA members;
 - BBPA survey data
 - Europe Economics small brewery relief report; and
 - Oxford Economics report on the impact of pubs and breweries
 - Other industry reports

- We spoke to seven BBPA members:
 - St Austell,
 - Adnams,
 - Greene King,
 - JW Lees,
 - Molson Coors,
 - Carlsberg Marston's, and
 - Admiral Taverns
- These members cover the key types of brewers and pubs (see next slide)
- This allowed us to identify issues distinct to each organisational structure as well as problems faced by all

- We obtained data from six out of seven members interviewed
- Data varied by members but we received a mix of:
 - P&L data over 3 years (sometimes on a monthly basis)
 - Cost breakdowns
 - Current inflationary pressures
 - Estimated inflationary pressures over the next year

- We utilised external resources such as:
 - Office for National Statistics,
 - Bank of England,
- These sources provided evidence of the wider macroeconomic trends to deepen our analysis, such as the prices of different commodities used in the production of beer
- By combining the qualitative and quantitative data we obtained, we were able to build a clear picture of the:
 - Landscape of the beer and pub sector
 - Different economic models of brewers and pubs
 - Current trends and their economic impact on brewers and pubs
 - How government could support the sector

We have spoken to a wide range of companies covering the key types of brewers and pubs

Company	Large Brewer	Medium brewer	Managed pubs	Leased and tenanted pubs
St Austell Brewery		\bigcirc	\bigcirc	\bigcirc
Adnams Brewing company		\bigcirc	Ø	Ø
Greene King		\bigcirc	Ø	\bigcirc
JW Lees		Ø	Ø	Ø
Molson Coors Brewery	\bigcirc			
Carlsberg Marston's	Ø			
Admiral Taverns			Small number	\bigcirc



Frontier Economics Ltd is a member of the Frontier Economics network, which consists of two separate companies based in Europe (Frontier Economics Ltd) and Australia (Frontier Economics Pty Ltd). Both companies are independently owned, and legal commitments entered into by one company do not impose any obligations on the other company in the network. All views expressed in this document are the views of Frontier Economics Ltd.