How do beer prices vary across different pubs? An empirical study.

STRUCTURED ABSTRACT

Purpose

This paper investigates the impact of pubs and breweries' attributes on beer prices by exploring and examining the variation of beer prices across pubs in York, United Kingdom.

Design/methodology/approach

Data gathered from five surveys of pubs conducted between 2012 and 2020 are used to test six research hypotheses analysing how factors such as location, type of ownership and management of pubs, beers' characteristics and breweries' attributes affect beer prices in the on-licence market.

Findings

Beer packaging, type of brewery, pubs' ownership and management all have a significant impact on beer prices, with beer on average cheaper in premises owned by pub companies and breweries compared to independently owned pubs.

Research limitations/implications

Findings can have implications in the first instance, on current fiscal policies affecting beer prices and, on a broader scale, regulating alcohol consumption.

Practical implications

Understanding beer price mechanisms in the pub sector offers valuable insights to practitioners and policymakers about designing and delivering policies and actions aimed at halting the decline of pubs in UK.

Social implications

Findings provide original information relevant for developing initiatives aimed at preventing excessive alcohol consumption in private premises, an issue commonly associated with problems such as alcohol-related diseases, loneliness, and antisocial behaviour.

Originality/value

This study is the first providing an empirical analysis of beer price mechanisms within the pub sector at such a granular level; findings have important implications for pubs and on-licence businesses, and for local communities and economies.

Keywords: Public houses, Beer prices, Craft breweries, Price Adjustment Mechanisms

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1. Introduction

In the United Kingdom ("the UK"), several studies have focused on public houses or pubs and their importance in terms of economic development, social aggregation, and the communities' wellbeing (e.g Maye et al., 2005; Muir, 2009; Cabras and Mount, 2017; Cabras and Lau, 2019). Many of these studies illustrated the positive impact generated by pubs in terms of employment opportunities, community cohesion and social engagement, reporting a progressing decline in their number and highlighting the potential negative implications for local communities and economies (Cabras et al., 2020).

Notwithstanding the importance of these issues, there is a lack of studies exploring factors and mechanisms affecting beer prices across pubs. This paper will argue that this relationship represents an important aspect of attracting customers and therefore securing levels of custom and financial viability for these licenced premises. This lack of studies is noteworthy, particularly in view of the significant increase of registered breweries in the UK since the early 2000s, predominantly driven by the upsurge of micro or *craft* breweries, which coincides with the progressive decline of pubs. One reason for this paucity is that significant attention has been devoted to investigating the main causes of pubs' closures, for instance the significant changes in the on-licence market structure and the increasing competition from off-licence retailers (Higgins et al., 2016). Another is the absence of consistent information suitable for analysing the variation of beer prices across licenced premises in the short, medium, and long term.

This paper aims to fill this gap by investigating which factors may affect beer prices in pubs, using an original panel dataset comprising information on prices and other attributes such as pubs' managerial and ownership structure, breweries' type and locations, and characteristics of beers sold. Information analysed in this study is gathered from pubs surveyed in the city of York, United Kingdom, between 2012 and 2020. We address the following research questions*: Does pubs' ownership/management affect beer prices? Are craft beers more expensive than industrially brewed ones? And what are the relationships between beer prices and beers, breweries, and pubs attributes?*

As the UK pub sector has been the subject of several investigations published in this journal over the past two decades (e.g.: Knowles and Egan, 2002; Andrew and Turner, 2012; Cabras and Mount, 2017; Martin et al, 2019), building on this knowledge can provide a valuable contribution to its readership. Analysing price-mechanisms affecting beers sold in the on-licence market would also add original knowledge on a topic for which there are no empirical studies (Nave, 2021), despite the cruciality of understanding multiple economic processes occurring in the brewery sector and within the wider hospitality management sector.

The paper comprises six sections, including this brief introduction. Section two provides an overview of UK pubs, addressing the changes that have occurred in the sector in the past thirty years, analysing how these shaped the current market structure. Section three presents the data and illustrates the methodology used to develop our study, providing research hypotheses. Section four explains the findings gathered from the econometric models developed in the analysis. Section five evaluates findings in light of the main research questions addressed by this study. Section six concludes.

2. Literature review

2.1 Pubs in the UK

Prior to the pandemic crisis, the beer and pub sector made a significant contribution to the UK economy. Pubs and bars are part of the so-called Night Time Economy ("NTE"). The beer and pub sector was estimated to be the UK's fifth-biggest industry, generating annual revenues of approximately £66bn and accounted for about 8% of the UK's total employment in 2018 (Masud, 2019). A report by Oxford Economics, commissioned by the British Beer and Pubs Association (BBPA), suggests that the sector generated nearly 900,000 jobs, sustaining '£12.1 billion of wages and £23.4 billion of GVA across the UK economy from direct, indirect and induced effects' (Oxford Economics, 2021 p.1).

Despite these remarkable figures, the number of pubs that ceased activity has dramatically surged in the past twenty years. There were about 47,200 pubs open in 2019, compared to 60,700 pubs open in 2000 (BBPA, 2020). These figures are likely to be further exacerbated because of the COVID-19 pandemic crisis, for which no clear data is available at the time of writing.

Reasons for the decline of pubs are various and include increased taxation for on-licence businesses compared to off-licence such as supermarkets, an increasing variety of home entertainment (DVD, video-game

boxes etc), tougher drink-driving laws and the smoking ban introduced in the 1990s and 2007 respectively. All these have further reduced the attractiveness of pub-nights (Preece, 2016; Cabras and Mount, 2017), providing an incentive for consumers to drink at home (Pratten, 2007).

However, an important factor to consider is the re-organisation the sector has undergone during the late 1980s. At that time, breweries owned 69% of pub stock, with the remaining 31% of pubs being independently owned businesses (Preece, 2016). In 1989, Parliament approved the Beer Orders which forced larger brewers controlling pubs to either sell their brewery business or to substantially cut the ties of over 2,000 pubs that they owned (Preece, 2016). However, brewers divested most of their pub estates to stand-alone pub companies, namely pubcos. These newly created companies started to replace large national brewers by acquiring pub stocks in large quantities and without limits, as pubcos did not brew their beers (Muir, 2009).

From the early 1990s, the number of lease and tenancy agreements in the pub market increased significantly, with large national brewers and pubcos controlling most of the UK pub stock (Preece, 2016), while the number of independently owned businesses dwindled. 'Tied pubs', pubs frequently compelled to buy their stock - notably beer - from the pubco owning or leasing their premises, accounted for about 55% of all UK pubs in 2011 (Cabras and Mount, 2017). However, the financial crisis in 2008 caused substantial losses to the largest pubcos, forcing these companies to disinvest and sell pubs, with many of these inevitably forced to cease activity (Andrews and Turner, 2012). Hence, at end of 2014, about 40% of British pubs were free houses, with another 40% owned or managed by pubcos, and the rest owned or managed by breweries. Nevertheless, tied houses were still forced to purchase the bulk of their beer stock from their landlords, in most cases pubcos or breweries, with tenants continuing to pay the rent irrespective of the level of income the pub earned (Preece, 2016). As a result, most tenants struggled to generate a profit above the minimum wage, with many leaving the business.

To correct this situation, in July 2016, Parliament approved the Market Rent Only (MRO) option for tenanted and leased pubs in England and Wales, approximately 12,000 at the time this new rule was introduced. The main objective of the MRO option was to release tenanted pubs from the intervention of landlords in their day to day management. The option gave tenants and lessees the possibility to request the end of all products and service ties and the cessation of the landlords' involvement in their trading operations. It also provided them with new rights and protections such as the ability to negotiate a fairer rent and to move 'free of tie' from their landlords, although landlords were still responsible for insuring pub premises.

The MRO option was initially welcomed by operators in the pub sector, although it attracted some criticism as it only affected six major pubcos – Admiral Taverns, Ei Group; Greene King; Marston's Plc; Punch Pubs & Co; Star Pubs & Bars (Heineken UK). These six pubcos controlled more than 500 tied pubs in England and Wales, de-facto excluding tenants and lessees renting from smaller pubcos from the operation of the MRO option. Moreover, the MRO option for tenants and leaseholders is only triggered at a time of contract renewal and is not retrospective. As a result, those tenants whose review/renewal occurred before July 2016 were not eligible to apply until their next contract review/renewal date. In addition, the first appointed Pubs Code Adjudicator, Paul Newby, in charge of supervising and ensuring the correct application of the MRO option, was formerly working for pubcos himself.

Table 1 shows the situation in 2020. At that time almost half (49.6%) of the UK pubs were independently owned, while 21% were owned by brewers and 29.4% by pubcos. Among the largest pubcos, Stonegate (who acquired Enterprise Inn in 2018) is reported to own one in ten pubs on the market. According to Foley (2021), around 13,900 pubs are directly managed by large national pubcos who let out their pubs to tenants. Tenants pay pubcos a rent and purchase all their stock directly from them, frequently at more expensive prices compared to those available in the free market. This situation has forced many tenants out of business in the past ten years.

[TABLE 1 HERE]

Table 1: Number of pubs controlled by largest national pubcos in the UK

2.2 Craft beers, consumers choices and prices

The decline of pubs in the UK has been in stark contrast to the sharp increase in the number of breweries in the country. In the past three decades, this number increased significantly from about 140 to over 2,300 between 1989 and 2019 (BBPA, 2020). Many of these breweries are frequently defined as *craft* breweries, although there is no consensus on the definition of a craft brewery. The Society of Independent Brewers (SIBA), an industry body which represents about 40% of all British breweries, defines craft breweries as 'truly independent' breweries (e.g., not a subsidiary of a larger firm with other attendant or subsidiary brewing interests) producing less than 200,000

hectolitres annually[1]. The term identifies businesses operating independently from large brewery corporations that use traditional methods to brew their products (Cabras and Bamforth, 2016).

The expansion of craft breweries has increased the variety of different craft beers available to British consumers, who now have a wide range of flavours from which to choose (Cabras, 2020). Several studies in literature analyse the demand for beer and its price elasticity in relation to brand and type (Tegene,1990; Lee and Tremblay, 1992; Hausman et al., 1994; Freeman, 2001); although there is still a paucity of research addressing cross-price elasticity among different types of beer.

Very few studies have investigated how craft beer prices compare with prices for other beers and the factors that may affect beer pricing across different types of beer. For example, consumers' age, younger beer consumers are driving the increase in demand for craft beers (Voight, 2013), although this could potentially be associated with trends, tastes, and willingness to experiment, with older consumers less inclined to try new beers. Another factor is the increasing perception among consumers that craft beer is a higher quality product compared to industrially, mass-produced beer (Toro-González et al., 2014). A growing number of beer consumers tend to be quite sophisticated in their choices, pushing breweries to recalibrate their advertising strategies (Lee and Tremblay, 1992; Iwasaki et al., 2008; Rojas and Peterson, 2008). In the case of craft breweries, especially small ones, their main advertising channels rely on social media and beer festivals, where they regularly showcase their beers (Voight, 2013).

The level of alcohol content or ABV (alcohol by volume) also affects the prices of beverages, including beer. Governments worldwide tend to progressively tax strong alcoholic beverages to prevent excessive levels of consumption although taxes and duties vary across alcoholic beverages (Meier et al., 2010). The resulting variation in prices can significantly shift consumption towards a variety of beverage types (Stockwell and Thomas, 2013) Public policy to reduce drinking is typically aimed at higher ABV beverages (Gill et al., 2015). However, heavy drinkers can typically afford the cheapest products, which tend to be lower ABV beverages (Lonsdale et al., 2012).

The location of licenced premises might also have an impact on both beer prices and consumption levels. There is little empirical research on this relationship (Pasch et al., 2009). From consumers, where pubs and bars are located does not seem a crucial aspect in driving consumption as much as beer prices and quality (Donadini and Porretta, 2017). However, people may consider pubs and bars as important amenities when deciding to relocate (Picone et al., 2010), therefore, their spatial proximity may affect consumption choices, shaping the demand for alcoholic beverages at a given location and the retail price (Godfrey, 1988). For beer, demand at a local level can be affected by income and average age of the resident population (Manning et al., 1995, Harwood et al., 2003), and imperfect competition across breweries in each area may drive variation in terms of prices (Treno et al., 2006).

While where beer is brewed may have little importance for beer consumers (Donadini and Porretta,2017), it can affect beer pricing in relation to transport and storage costs (Meier et al., 2010). Consumers may also have preferences in terms of packaging (e.g., bottles instead of aluminium cans) which may signify higher transaction costs and, in turn, increase beer prices (Baldwin and Harrigan, 2011). Transaction costs associated with efficiency of supply chains and distribution systems account for a substantial proportion of variation of beer prices (Andersson and Kokko,2013). Similarly, differences in taxation and duties, trade policies and market features may lead to price variations, for example, since Hungary joined the European Union in 2004, the share of imported beers expanded rapidly as most beer imports became duty-free (Bakó and Berezvai, 2013). Domestic consumers may perceive imported beers as qualitatively higher products and therefore be prepared to pay a premium for them (Görg et al., 2010).

The cost of beers purchased by pubs, known as beverage or *pour* cost, play an important role in determining beer prices within pubs. Pour costs vary significantly depending on the type of businesses. Pubs controlled by pubcos and breweries are likely to sustain lower pour costs for their beers compared to free houses., Although free houses might be able to cut better deals with local breweries compared to others, making a better and more efficient use of local networks for their supplies (Cabras et al, 2016). Obtaining data regarding pour costs from pubs or their suppliers is almost impossible, as deals are kept strictly confidential for reasons such as competitive pricing, marketing strategies and other economic aspects that keep these very businesses in the market.

Overall, pubs' beer prices are affected by a set of complex internal and external factors. Internal factors include the pub's size and location, its management style and ownership structure, and their related marketing, branding, and advertising strategies that affect its profitability and costs (Andrews and Turner, 2012; Martin et al., 2019). External factors are mainly associated with beer market competition forces, both in the UK and abroad (Maehle

[1] These breweries must also meet and abides SIBA's Food Safety and Quality standards.

and Capitello, 2021). Levels of competition and the overall state of the beer market play an important role for UK breweries. The latest data shows that competition in the UK beer market is reaching its peak, especially for the craft beers (SIBA, 2020). In this context, both breweries and pubs tend to apply competition-based pricing strategies aimed at minimising their costs to provide better price deals to customers. However, many UK pubs, particularly independently owned pubs, apply value-based pricing strategies by promoting the quality and range of their beers. Given the latest trends in beer consumption, these pubs tend to expand and update their beer lists more frequently than others, exploiting the local origin of a given beer as a unique feature to attract more custom (Bazzani and Canavari, 2013; Farris et al., 2019).

In summary, pubs face a constant dilemma to either set beer prices that are "high enough" to reflect the uniqueness and quality of beers, while "low enough" to meet both the expectations and budgets of their customers.

3. Methodology and data analysis

3.1 The dataset

The objective of this paper is to examine whether and how factors such as location, type of ownership and management of a pub, as well as beers and breweries' attributes, affect beer prices in the on-licence market. To achieve this objective, we examine information on beer prices collected from five surveys conducted in the city of York, United Kingdom, between 2012 and 2020. The York Beer Census (YBC hereafter) is a biannual event run by the local CAMRA Branch and consists of surveying all bars and pubs open in the city on a given day of the year, usually in spring. This exercise, carried out by local volunteers, enables the local CAMRA branch to collect comprehensive information regarding the range and variety of beers sold in the surveyed pubs, their ABV and prices per pint. YBC organisers allocate pubs to volunteers based on information gathered from *Whatpub.com*, an open-source website which provides detailed information about pubs operating in the UK. Volunteers visit pubs and use hard-copy templates to complete surveys for each of their visits; these are then inputted in a dataset which is updated and collated at the end of the survey. Once the dataset is completed, data are further refined by verifying beer provenance. Breweries' location is ascertained by cross-checking information provided by *Quaffale.com*, another open-source website which lists all the breweries – whether small or large - operating in the UK at the time the YBC is conducted.

The level of cooperation to the YBC from York publicans during the five censuses has been extremely high, as shown by the overview provided in Table 2. After collecting the data and excluding the outliers as well as missing observations from the sample we came up with 252 pubs surveyed at least once between 2012 and 2020, identifying 45 pubs for which information was captured in all five surveys. We focus our analysis on this subsample to monitor average beer prices in a consistent and effective manner. Results about the average beer prices across the considered time span are likely to be driven by either consumer's preferences or pubs' choices, enhancing the robustness and value of the analysis.

About three in ten pubs of our subsample are located within York city centre, the remainder are scattered across other areas of the city. 30 pubs are owned by pubcos, six by breweries and nine are freehold either run by individual entrepreneurs and/or families, or private companies. The final dataset captures information for 695 beers traded by these pubs during the period considered. Nearly six in ten beers identified in our analysis (396) were sold in pubs run by pubcos, with more than a third (cumulative 247) sold in freehold houses.

Figure 1 summarises several key aspects related to our dataset. Firstly, the number of unique beers sold in the surveyed pubs increased from 158 to 208 in the timespan considered, with cask beers remaining the largest proportion. More than 70% of the beers sold were kept on the pubs' menu for just one year, whereas less than 5% were on the menu for the whole period under examination. Secondly, data indicates that the inclusion of new beers listed on pubs' menus happened on a regular basis, of these, the proportion of beers from craft breweries increased since 2012, matching the proportion of beers from industrial breweries in 2020 (c). About one in five beers sold in the surveyed pubs were brewed within 40-miles away from York in 2012, with more than half brewed elsewhere in the UK and 21% brewed overseas (d). Eight years later, the proportion of 'local' beers increased to 30%, while the proportion of 'overseas' beers halved, with the proportion of beers brewed elsewhere in the UK slightly increased.

[TABLE 2 HERE]

Table 2: Population and sample: an overview

[FIGURE 1 HERE]

Figure 1: Data overview

3.2 Research hypothesis

The information in the dataset includes beer attributes such as price, type, ABV, brewery supplying the beer, its location, and whether it is classified as a craft brewery according to SIBA. Other information includes the location, management, and ownership of the surveyed pubs. For the purposes of this paper, we focused on selected pubs to track developments in beer ranges and prices.

Table 3 describes the data and variables addressed in our study. *Average Price* and *ABV* represent the average beer price and the alcohol volume of each beer recorded in the surveyed pubs respectively. *Beertype* and *Brewtype* are dummy variables referring to whether the beer comes in keg (1) or cask (0), and whether it is brewed by a craft brewery (1) or an industrial brewery (0). *Brewplace* identifies whether the beer is brewed within 40 miles of York (0) or produced somewhere further away in the UK or abroad (1). Location refers to whether the pub is in the city centre (1) or elsewhere in York (0). *Ownership* identifies whether a pub is owned by an independently owned business run by a freehouse (0) or by a brewery (1), or by a pubco (2). *Management* identifies whether the pub is run by tenants (1) or directly managed by owners (0).

According to SIBA (2020), many brewers find the profit margins they get from selling cask beers to retailers or wholesalers either low or very low. As cask beers are considered more traditional, the recent rise in tastes and flavours for British beer has affected their appeal and appreciation, particularly during hot summers when keeping cask beers at the right temperature is challenging. Overall, consumers recognise and perceive cask beers to be cheaper than keg beers and are ready to pay a premium for keg beers if the pub and brewery get the quality right (SIBA, 2020). Indeed, Ashworth (2019) reports that 40% of cask beer drinkers will not return to the same pub if the quality of the beer served is not up to standard. Furthermore, with the rise of the craft beer movement, consumer preferences shifted from traditional beers toward more sophisticated and flavoured ones (Clemons et al., 2006; González et al., 2014), increasing their willingness to pay a premium for more complex beer tastes and flavours (Gabrielyan at al., 2014). As such, given the scale and relatively low level of investments, craft breweries are freer to experiment with their batches and can set higher prices on their beers compared to industrial breweries. As such, craft beers are usually more expensive than beers made industrially. Considering these assumptions, we formulate the following hypotheses:

Hypothesis 1: *Keg beers are on average more expensive than cask beers.*
Hypothesis 2: *Beers brewed by craft breweries are more expensive than those brewed by industrial breweries.*

Since the changes brought by the Beer Orders in 1989, the pub retail industry has become shareholder focused (Preece, 2016). From the early 1990s until the late 2010s, pubcos acquired most free houses, hindering the chances for new breweries to expand their supply network (Cabras and Bamforth, 2016). Most recent data show that pubcos still control one third of the UK beer market and its related supply chain (SIBA, 2020), which enable them to reach economies of scale and to offer beer in their pubs at lower prices compared to free houses, aided by tighter distribution channels (Knowles and Egan, 2002). As for pubs owned by breweries, lower beer prices are likely to be related to lower transaction costs, for instance no costs on logistics related to beer supplies, shortages, or surpluses. Based on these assumptions, we formulate the following hypothesis:

Hypothesis 3: *Beer prices in pubs owned by either a pubco or a brewery are lower than beer prices in independently owned pubs or free houses.*

Pubcos tend to lease their pubs through tenancy agreements of varying lengths and conditions (Cabras et al., 2016). This situation frequently leads to tenanted pubs setting lower beer prices compared to independently owned or directly managed pubs, putting additional pressure on them, and increasing competition in the market. Nearly a quarter of the UK pubs ceased business since 2010 (ONS, 2018). In recent times, there has been a resurgence of small directly managed pubs mainly due to new consumer preferences towards niche and locally brewed craft beers. This situation might enable local breweries as well as small, directly managed pubs to keep higher prices given their quality beers. Although there is no recent empirical evidence on whether beer prices significantly vary

across pubs with different types of ownership (Higgins et al., 2016). Based on these assumptions, we formulate the following hypothesis:

Hypothesis 4: *Beers sold in directly managed pubs are more expensive than those sold in tenanted pubs.*

Beer prices in pubs may vary depending on the pub location as well as the level of competition within spatial proximity, although price variations could be small (Gruenewald et al., 1993). The distance between where beers are brewed and sold could affect beer price and consumption level, although there is little empirical research on this (Treno et al., 2007; Pasch et al., 2009). More recently, beer consumers started perceiving local beers as qualitatively higher and more diverse - in terms of flavours and tastes - compared to beers produced by larger, industrial brewers. In this context, pubs selling a wider range of beers will probably attract more visitors. In addition, pubs that sell beers brewed locally might be able to charge higher prices by meeting consumers' demand for local craft beers. According to the value-based pricing strategy, pubs might charge higher prices on beers produced locally by promoting their higher quality and unique tastes (Helmold, 2020). In addition, breweries located in spatial proximity to pubs would minimise transactional costs associated with transport and distribution of their beers, allowing pubs to charge cheaper prices for them (Köksalan et al., 1995). However, a high level of competition in local markets may push pubs towards a competition-based pricing strategy, forcing them to offer lower beer prices and squeezing their profit margins. All these elements significantly increase the complexity of determining whether locally or non-locally brewed beers are more expensive. Considering the latest trends in consumer preferences, we formulate our hypotheses as follows:

Hypothesis 5: *The larger variety of beers listed in pubs, the higher beer prices on average.*
Hypothesis 6: *Local beers are on average more expensive than beers produced somewhere else in the UK or abroad.*

Table 4 provides Spearman's correlations across all our variables of interest. Keg and craft beers show a positive correlation with beer prices, and so do beers brewed further away from York. Beer prices are also more expensive in relation to higher ABV and pubs' location, with pubs located in the city centre charging higher prices compared to pubs located elsewhere. Beers are on average cheaper in pubs run by tenants and, in general, cheaper in pubs owned by either pubcos or breweries. There is a positive relationship between beer prices and the variety sold in surveyed pubs. Coefficients in the table reveal a strong positive association between pubs owned by pubcos and managed by tenants. Overall, the sign and significance of correlation coefficients in the table are as expected.

[TABLE 3 HERE]

Table 3: Variables used in this study

[TABLE 4 HERE]

Table 4: Correlation table

4. Regression modelling

We developed a cross-section linear regression model, as elicited in Equation 1, to examine the effect of attributes associated with beers, pubs, and breweries on average prices across years. We focused on cross-section analysis for two reasons. Firstly, more than 70% of beers comprised in our dataset were kept on pubs' menu for one year only, reducing the possibility to analyse beer prices across time[2].Secondly, although changes might have happened over the period analysed, their impact was cumulative and lasting rather than marginal and marked on a yearly basis. While a cross-section analysis prevented us from tracking year-by-year changes, it enabled us to make robust conclusions regarding the overall trend in beer pricing over the last eight years of consideration.

[2] To further corroborate our findings, we also applied a panel approach including lagged values of beer prices. With this approach, variables referring to beer attributes, brewery type and pub characteristics, while having a significant impact on average beer prices over the analysed timespan, did not show any significant influence on average beer prices in each year considered. For this reason, we decided not to include results from this approach in the paper.

$$y_i = \alpha + \beta x_i + \varepsilon_i \, (1)$$

Table 5 displays different model specifications with variables inserted by following a step forward procedure. The explanatory power of the model grows as more variables are added, which proves the importance of factors under consideration. Models 1-5 indicate that beer type, brewery place and type, ownership and management of a pub have a significant effect on beer prices. More specifically, keg beers are more expensive than cask beers (accept H1). This conclusion is also supported by data illustrated in Figure 2, which shows the minimum, maximum and average prices between cask beers and keg beers. Average prices of cask beers are lower than average prices of keg beers in the 10-years timespan examined. While minimum prices are similar across keg and cask beers, maximum prices are, except in one case, distinctly higher for keg beers in each year considered.

[FIGURE 2 HERE]

Figure 2: Cask and keg beers: trends of surveyed beer prices (in pound sterling)

Besides the differences across different beer types, we find that beers brewed by craft breweries are more expensive than those brewed by industrial breweries (accept H2). In addition, we find that local beers are significantly lower in price than beers brewed somewhere in the UK or abroad (reject H6).

We include an interaction effect between pub ownership and management to Model 6 to disentangle the effect of management on beer prices across different ownership types, particularly with reference to pubs owned by pubcos. The model confirms our prediction that beer prices in pubs owned by either a pubco or a brewery are lower than beer prices in independently owned pubs or free houses (accept H3), with tenanted pubs showing on average lower beer prices compared to managed pubs (accept H4). The level of significance associated with the interaction effect between ownership and management confirms that tenancy agreements lead to lower beer prices across the surveyed establishments. However, the difference in beer prices between directly and non-directly managed pubs controlled by pubcos and breweries is less marked than for independently owned pubs. This conclusion corroborates the literature that suggests that pubs controlled by pubcos and breweries may still achieve economies of scale by reducing operational costs, although these would not necessarily lead to higher markups on beer prices.

Models 7 shows that beers with a higher level of alcohol content are more expensive, while Model 8 indicates that beers sold by pubs located in the city centre are more expensive compared to those sold by pubs located elsewhere. Model 9 demonstrates that the larger variety of beers listed in pubs does not have a significant effect on average beer prices (reject H5). Model 8 is corrected for heteroscedasticity and tested for multicollinearity issues based on variance inflation factor (VIF), making the model the more robust among all the nine presented.

[TABLE 5 HERE]

Table 5: Cross-section analysis

5. Discussion

The findings gathered from the econometric analysis in the previous section provide original insights on the factors affecting beer prices for beers sold in British pubs and in relation to different attributes specific to beers, breweries, and pubs management. Specifically, the analysis enabled us to test and verify the six-research hypothesis at the base of our study.

It appears from results that keg beers sold across the surveyed pubs are on average more expensive than beers supplied in casks, with a significant difference between the average prices for beers brewed by craft breweries compared to those brewed by industrial ones. These findings reflect changes in consumers' behaviours over the last years, with beer prices' premiumisation likely be linked with the growth in kegged craft beers rather than industrially brewed keg beers, traditionally mainstream lagers. The Marston's On-Trade Report released in 2019, prior to the COVID-19 pandemic, indicated a combined 2.9% decline in the traditional keg and lager beer sales, aside from a more marked decline in cask beer sales (-8.2%). However, the growth for premium mainstream lagers and world lagers (+5.6% and +10.5% respectively) was less than the growth reported by craft category (15.7%, Marston 2019). Moreover, the volume of craft beer supplied in kegs rather than casks has constantly increased since 2015 (SIBA, 2020), demonstrating a shift in consumers' preferences towards niche products and explaining why consumers are ready to pay higher prices for craft keg beers compared to other beer types.

Aside from packaging, our analysis found that breweries' location has a significant effect on the final beer price, corroborating evidence provided by the recent literature on craft beers which portrays consumers willing to pay more for local beers compared to non-local ones, associating the price premium to a wider perception of higher quality, genuine ingredients, and traditional values (Cabras and Bamforth, 2016, Garavaglia and Swinnen 2018). Craft brewers seem to exploit this perception when pricing their beers, trying to capture extra-profits without the need to capitalise on sale volumes, as frequently happens with larger, industrialised brewers (SIBA, 2020). Nevertheless, pubs may still get better deals from local brewers when purchasing their stocks, as these would experience lower transport and distribution costs compared to brewers located further away (Rojas and Peterson, 2008).

The analysis seems to confirm the proposition that local beers in our sample are on average cheaper than beers produced somewhere else in the UK or abroad. However higher transportation costs associated with the latter may only be part of the reason. Other factors would be customers' demand, ownership structure, and social networks and ties which might determine pubs' beer purchases. Assuming a constant growing demand for craft beers, local breweries would be advantaged in supplying independently owned pubs, as they would have more flexibility in terms of negotiating prices compared to pubs owned by, for instance pubcos, where purchases are centralised and therefore based on volumes. In our sample, pubs' managerial and ownership structures are important factors to consider when examining beer portfolios across licenced premises and their prices. We detected significantly lower prices for beers sold in pubs owned either by a pubco or a brewery compared to independently owned pubs or free houses. We found that beers sold in directly managed pubs are more expensive than those sold in tenanted pubs, and the difference in prices is larger for independently owned pubs.

These findings corroborate evidence in the literature indicating pubcos can charge cheaper beer prices in their pubs given their purchasing power and ability to cut more advantageous deals with breweries, particularly larger ones (Carroll and Swaminathan, 2000). Pubs owned or run by breweries, including craft and small breweries, can charge cheaper prices due to no transaction costs associated with supplied beers, as many breweries use these pubs as their main outlets, 'hosting' or swapping beers with other breweries at zero or very little cost. This situation leaves independently owned businesses with less manoeuvring space on beer prices, as they do not have the same advantages in terms of scale economies and cost savings compared to other pubs (SIBA, 2020).

From a practical side, cheaper prices for local beers may also reflect the fierce competition among small and micro craft breweries located within spatial proximity of pubs. Pubs may be have an advantage when negotiating stock supplies as breweries, especially smaller ones, would find themselves forced to offer discounts and lower their prices to maintain their custom and secure orders, under-cutting each other into a bottom-price race which inevitably would make these businesses unsustainable in the long run. This outcome would not benefit either pubs or breweries, as stated by Atherton (2017, p.2), '*licensees may feel they are getting a bargain and turning a profit, but the truth is cheap cask beer is just that and it won't be long before drinkers notice this. Low-price produce simply doesn't command respect and both brewers and drinkers feel this influences cask beer quality'.*

We tested whether surveyed pubs offering a larger variety of beers charged higher prices. Pubs with wider beer portfolios would be better positioned to cater for 'beer snobs', a growing segment of consumers very sophisticated and selective in their beer choices, who drink craft beers and tend to avoid mass-produced ones (Iwasaki et al., 2008; Toro-González et al., 2014). Beer snobs are essentially a result of the substantial global expansion registered by craft beers and breweries in the past two decades. As the level of sophistication associated with beer choices is increasing (SIBA, 2020), this segment of customer is set to continue to grow at a faster rate compared to other segments, for instance more traditional customers looking for 'value for money' beers (Netemeyer at al., 2004). In this context, craft beer consumers tend to be variety seekers compared to traditional ones. Pubs with larger beer portfolios would then guarantee a wider selection of beers to satisfy their demand, charging higher prices in return. Although our analysis did not find any significant impact between pubs' beer portfolio and prices.

Tenants and leaseholders of pubs owned by pubcos willing to increase their beer portfolios have their options limited by contractual obligations within the tie system. The MRO, introduced five years ago to ensure that tenants from larger pub companies would have been no worse off than if they were free of tie, should have increased opportunities for these businesses to expand their beer portfolios. However, of the 739 MRO applications made prior to the COVID-19 pandemic, only 57 resulted in MRO tenancies, and the MRO itself attracted widespread criticism as it failed to deliver what was initially promised to tenants and leaseholders (Davies, 2019). As for independently owned pubs and mostly for smaller ones, diversifying beer portfolios would probably come at a cost given that a larger beer selection at the pumps would require extra-resources and pose challenges in maintaining the freshness of their stock particularly with the rotation of cask beers which still represent the bulk of their listings.

Understanding how beer prices differ across different pubs that sell them would help these businesses to adjust beer prices in accordance with both customers' demands and consumption trends. A better understanding of beer price mechanisms would also be useful for policymakers when proposing new and reviewing current fiscal policies affecting beers and other alcoholic beverages and, on a broader scale, regulating alcohol consumption. According to Harwood et al. (2003), the pricing and promotion of beer vary systematically regarding attributes and characteristics of communities and neighbourhoods, where pubs act as important third places (Cabras and Mount, 2017). Such variations in pricing could encourage drinking behaviours in private premises which are commonly associated with social problems such as domestic violence, traffic fatalities and chronic health issues (Bray et al., 2009). Excessive low prices for alcoholic beverages sold by licenced premises might cause more compulsive purchases of alcoholic beverages which might lead to excessive consumption (Raab et al., 2011). Findings from this study could be of interest for governmental bodies and agencies in view of reviewing tax levels on beers and other alcoholic beverages and, indirectly, useful in relation to policy discussion around regulating alcohol consumption within licenced premises in the UK.

6. Conclusions

This paper explored and examined the multiple relationships between on-licence beer prices and attributes such as pubs' managerial and ownership structure, types and location of breweries, and types of beers sold. We aimed at answering three research questions: (a) whether pubs' ownership/management affected beer prices; (b) whether craft beers were more expensive than industrially brewed ones; and (c) whether any relationships could be identified among beer prices and attributes of beers, breweries, and pubs. We answered these questions by analysing data collected from pubs in York surveyed between 2012 and 2020, testing six research hypotheses which confirmed our initial propositions in four cases.

Theoretical Implications

Findings from our analysis increase the general understanding about how beer prices differ across pubs that sell them, a much under-investigated subject, as most of the recent research on beer brewing focused on product-specific characteristics such as aroma, branding, and packaging (Köster, 2009; Sester et al., 2013). However, in times of prolonged economic uncertainty as well as increasing competition in the beer market, further exacerbated by the recent COVID-19 pandemic, acquiring original information on aspects concerning both price mechanisms and consumers' behaviours is crucial for market operators (SIBA, 2020). The analysis of price differences for beers sold in pubs owned by pubcos, breweries, or free houses identifies a particular market scenario related to craft beers in the UK. Previous studies indicates that the purchasing power exerted by pubcos and large breweries becomes relevant when purchasing large volumes of industrially brewed beers (e.g. Andrews and Turner, 2012; Preece, 2016). Nevertheless, their power seems reduced when purchasing beers from craft breweries, as the vast majority of these have limited volumes and operate at a local scale (Sozen et al, 2021; Nave et al 2021). Moreover, craft breweries tend to have flexibility in terms of quantities and ranges produced (Bachman et al., 2021). As independently owned pubs are more versatile in their supply purchases, they can stock and offer more craft beers compared to other pubs. This situation puts independently owned pubs in a better position for capturing the growing segment of UK beer consumers whose preferences are for distinct flavours and more varied beer styles (Parker et al., 2020).

Practical Implications

Pub-specific characteristics such as ownership, management, and location, influence the total level of costs and therefore price thresholds on beers that pubs might set. This information can help profiling customers according to their choices, as well as supply knowledge to support the review of policies aimed at both supporting pubs (and preventing some unnecessary business closures) and limiting excessive alcohol consumption in private premises and uncontrolled environments. Cheaper prices for alcohol beverages might cause more compulsive purchases which might lead to excessive consumption. Understanding which factors affect beer prices would be of particular interest for public health agencies in terms of monitoring and addressing alcohol abuse and related social problems, equally for other governmental agencies that advise on taxation and alcohol duties, which indirectly regulate alcohol consumption in the UK. Likewise, findings from this study can stimulate research on beer price mechanisms within on-licence premises in other countries. For example, using the price differences between cask and keg, as proxies for examining other types of packaged beers (e.g., bottles or cans) available at the counter.

Limitations and Future Research.

Although the findings from our study provides an original contribution to the field, they also present some limitations. The information analysed relates solely to pubs located in York. A small number of other cities in the UK have organised beer censuses in the past, however their data collection occurred over fewer years. For instance, we obtained data from beer censuses organised in both Nottingham and Norwich, but only for two years (2012 and 2014), and the proportion of surveyed pubs was lower than those surveyed at York in each year of reference, providing no adequate data to conduct our analysis. Moreover, while information collected at York proved to be consistent and robust across the timespan considered, we are fully aware that our data sample comprised five years of observations and that more years could have led to more robust results. However, with the next YBC scheduled in 2022, analysing the changes in beer prices with a panel data approach could provide more information in relation to the incremental effect of COVID-19 on the beer sector since the pandemic started. In addition, and for reasons explained earlier in the paper, we could not include any information related to pour costs of beers in our analysis.

We are aware that examining this information would have enhanced the quality of our findings even further. Given the difficulty in obtaining such information, we hope this study can provide an incentive for other researchers. Likewise, the evidence discussed in this paper supplies an incentive for further research in the field of hospitality management and beyond, offering up-to-date information to practitioners and policymakers regarding price mechanisms within the UK on-licence market.

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TABLES AND FIGURES.

Table 1: Number of pubs controlled by largest national pubcos in the UK

Pubco	Number of Pubs	Percentage of pubcos[1]	Percentage of all pubs[2]
Stonegate	4,708	33.87%	9.97%
Mitchell&Butlers	1,160	8.35%	2.46%
JD Weatherspoon	871	6.27%	1.85%
Whitbread	768	5.53%	1.63%
New River Retail	720	5.18%	1.53%
Admiral Taverns	594	4.27%	1.26%
Trust Inns	350	2.52%	0.74%
Young&Co.'s Brewery	276	1.99%	0.58%
Other pubcos (cumulative)	4,453	32.04%	9.43%
Subtotal	**13,900**	**100.00%**	**29.45%**
Pubs owned by brewers	**9,900**		**20.97%**
Independently owned pubs	**23,400**		**49.58%**
Total	**47,200**		**100.00%**

[1] *Calculation obtained as a ratio with the subtotal.* [2] *Calculation obtained as a ratio with the total. (Source: authors' elaboration from Statista 2020, Foley 2021)*

Table 2: Population and sample: an overview

a) Population				b) Sample (N=45)		
Year	Pubs operating in York	Pubs surveyed during YBC	Percentage of pubs surveyed	Pub Ownership	Number of Pubs	Number of Beers
2012	239	211	88.3%	0 - Freehouse (company)	2 (4%)	116 (17%)
2014	224	193	86.2%	1 - Freehouse (individual/family)	7 (16%)	127 (18%)
2016	227	204	89.9%	2 – Brewery	6 (13%)	54 (8%)
2018	204	170	83.3%	3 – Pubcos	30 (67%)	398 (57%)
2020	220	195	88.6%	**Total**	**45 (100%)**	**695 (100%)**

Table 3: Variables used in this study

Domain	Variable	Description	Type
Beer	**Average Price**	Average beer price across years of observations	Continuous
	ABV	Alcohol by volume	Continuous
	Beertype	Type of beer: Keg / Cask	Nominal (1/0)
	Beervariety	The number of beers in a pub's menu on average[1]	Continuous
Brewery	**Brewtype**	Brewery type: Industrial /Craft	Nominal (0/1)
	Brewplace	Brewery location: 40 miles within York / somewhere in the UK or abroad	Nominal (0/1)
Pub	**Location**	Pub location: citycentre / other areas	Nominal (1/0)
	Ownership	Pub's ownership: freehouse (company or ind/fam); brewery; PubCo	Nominal (0/1/2)
	Management	Type of management: tenant/manager	Nominal (1/0)

[1] We calculated the number of beers listed by individual pubs per year of reference, identifying the average across five years of observations.

Table 4: Correlation table

	Average Price	Beertype	Brewplace	Brewtype	Management	Ownership	ABV	Location
Beertype	0.268***							
Brewplace	0.217***	0.190***						
Brewtype	0.104***	-0.475***	-0.254***					
Management	-0.120***	-0.084***	-0.009	-0.071**				
Ownership	-0.160***	-0.010	0.023	-0.208***	0.749***			
ABV	0.450***	0.213***	0.187***	0.034	-0.147***	-0.175***		
Location	0.104***	-0.010	-0.011	0.122***	-0.055*	0.078***	0.145***	
Beervariety	0.062**	-0.160***	0.033	0.279***	0.052*	-0.066**	0.111***	0.005

Table 5: Cross-section analysis

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Beertype	0.474***	0.424***	0.744***	0.725***	0.713***	0.701***	0.541***	0.539***	0.545***
	(0.0485)	*(0.0489)*	*(0.0451)*	*(0.051)*	*(0.051)*	*(0.051)*	*(0.047)*	*(0.055)*	*(0.047)*
Brewplace		0.300***	0.439***	0.437***	0.418***	0.398***	0.311***	0.311***	0.301***
		(0.056)	*(0.053)*	*(0.052)*	*(0.052)*	*(0.052)*	*(0.047)*	*(0.052)*	*(0.048)*
Brewtype			0.728***	0.709***	0.636***	0,616***	0.490***	0.476***	0.461***
			(0.052)	*(0.052)*	*(0.054)*	*(0.053)*	*(0.049)*	*(0.054)*	*(0.050)*
Management				-0.131***	0.150**	-0.674***	-0.502**	-0.450**	-0.413**
				(0.046)	*(0.070)*	*(0.215)*	*(0.194)*	*(0.111)*	*(0.197)*
Ownership					-0.210***	-0.274***	-0.180***	-0.194***	-0.175***
					(0.040)	*(0.043)*	*(0.039)*	*(0.037)*	*(0.042)*
Ownership_Management						0.471***	0.363***	0.346***	0.322***
						(0.116)	*(0.026)*	*(0.063)*	*(0.106)*
ABV							0.432***	0.424***	0.418**
							(0.026)	*(0.050)*	*(0.026)*
Location								0.086*	0.091**
								(0.046)	*(0.043)*
Beervariety									0.001
									(0.001)
cons	3.431***	3.231***	2.672***	2.770***	2.942***	3.009***	1.168***	1.191***	1.159***
	(0.033)	*(0.049)*	*(0.061)*	*(0.070)*	*(0.076)*	*(0.078)*	*(0.129)*	*(0.221)*	*(0.132)*
N	1249	1249	1249	1249	1249	1249	1249	1249	1249
R-sq	0.071	0.092	0.216	0.220	0.237	0.247	0.389	0.391	0.392
Adj. R-sq	0.070	0.091	0.214	0.218	0.234	0.243	0.385	0.387	0.387

Standard errors in brackets; * p<0.05, ** p<0.01, *** p<0.001.

Figure 1: Data overview

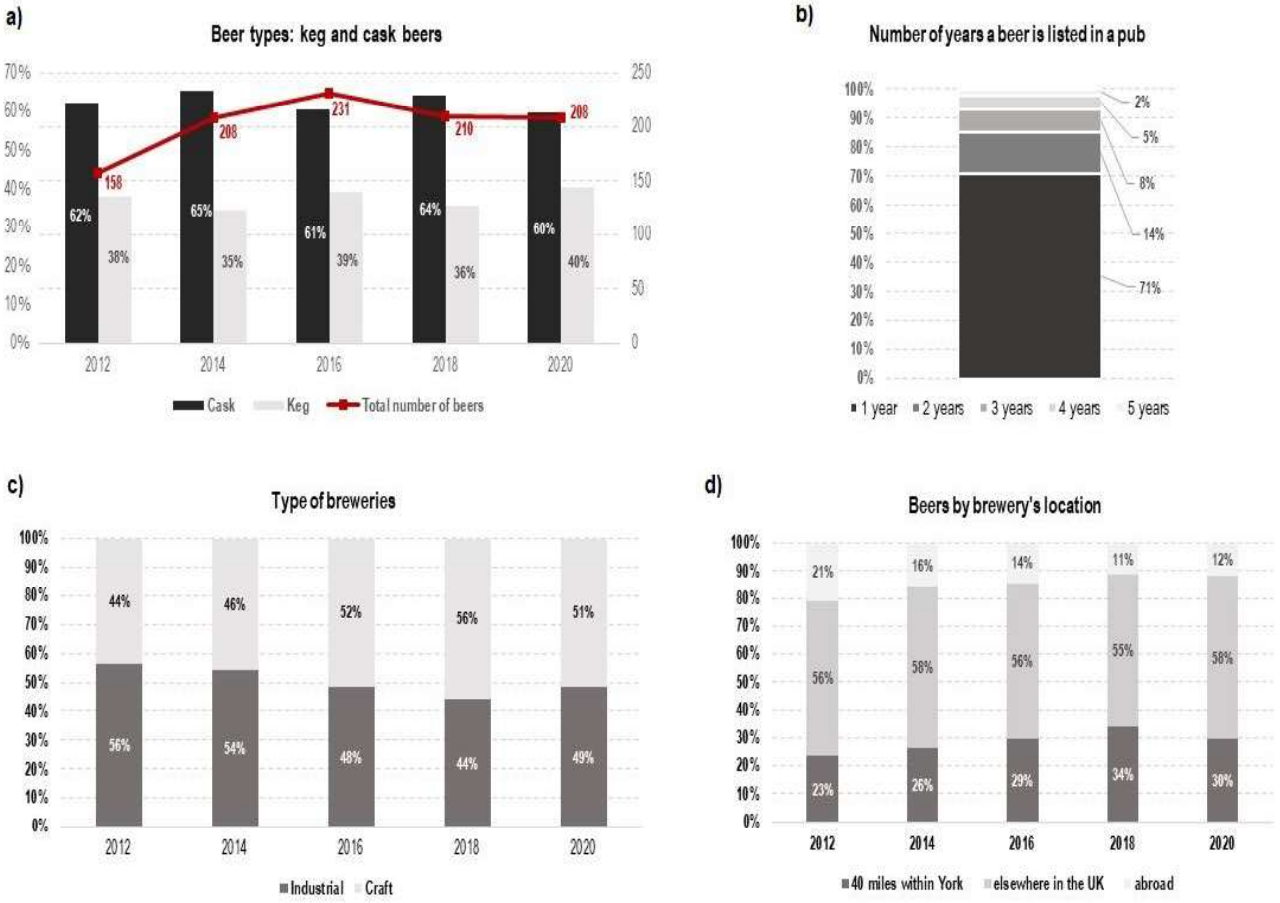

Figure 2: Cask and keg beers: trends of surveyed beer prices (in pound sterling)