

COMPETITION AND OLIGOPOLY IN THE UK BEER MARKET: HOW DO SMALL BREWERS SURVIVE?

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Chapter 1: Introduction

This article looks to examine the present U.K. beer market and how small, cask ale brewers interact and compete with others around them. Once the characteristics of beer as an economic good have been ascertained, attention shall focus on how small brewers act upon this. Through gleaning the existing literature, establishing an up-to-date model for the long run demand for beer, and direct interviews with small brewers, a vivid picture for what it takes to survive as a cask ale brewer will be presented.

It is necessary to first look at the changes to the U.K. brewing industry since the late 1980s in order to appreciate the current market dynamics. This is not an arbitrary choice; in 1989 the Monopolies & Mergers Commission published a report¹ recommending a break up of the extensive vertical integration that was present in the Beer Market at that time. The resulting legislation caused the nature of brewing and retailing beer to be transformed in a major way, changes that aimed to break up a market which had displayed classic oligopolistic tendencies.

Next, historical context will be given as a prelude to the late 1980s oligopoly, before undertaking an analysis for a new entrant and finally a brief summary will be given of the current state of U.K. beer market.

1.1 Historical background

Towards the end of the 19th Century in Britain, in part due to the introduction of the 1869 Beer and Wine Act,

the system of establishing Tied Houses began to rear itself. All brewers, including the ‘Burton Brewers’ who previously relied on the superiority of their beer to get them into any public house, were beginning to build up property portfolios as Tied Houses were refusing their alcohol.

With owning property came the implicit restriction of other brewers selling their beer in those premises. This being the precedent, competition stepped up to purchase outlets as forward integration was the surest way to guarantee beer sales.

This industry set up continued, largely undisturbed until the post war years. The next major shake up in the market came towards the end of the 1950s and through to the 1970s with a number of horizontal mergers occurring.

There are a number of reasons for this, some of which can be attributed to general economic factors, such as a flexible stock market that meant less cash was needed upfront for deals, thus facilitating merger activity.

Others were related more directly to the U.K. beer market. The growing level of beer demand in the UK, coupled with a realisation in the City that many of the brewers’ had undervalued assets spurred brewers into activity. Merging resources was the best way of increasing scale economies, increasing efficiency and subsequently fending off attack from predatory takeover bids that looked to utilise the value of the Brewers’ property.

There is much documentation on specific deals that took place in the time period prior to *The Supply of Beer* which shall be omitted for the sake of repetition.

By the late 1980s, there were six national brewers in the U.K. Beer Market. Together they were responsible for 75% of the total beer production in the U.K. in 1985.² With the system of Tied Houses, these brewers held considerable market power. Though it should be noted that the grip of tied trade had loosened somewhat, with the growth of import dependence and growth in ancillary segments such as restaurant and off-licence sales.³

1.2 Five forces analysis: Grolsch

Due to its succinctness and applicability for analysing the pressures faced by firms, a desirable method for evaluating the beer marketplace in the 1980s is through Porter's Five Forces.⁴

The Five Forces is a framework commonplace in industrial economics for analysing industry competitiveness and business strategy. The competitiveness of a market is measured next to five metrics. Together, they complete a picture of the environment faced by firms in an industry, thereby allowing cross-industry comparison. Three of the measures are external pressures (threat of substitute goods, threat of new entrants, and rivalry of existing competition), and two are internal (bargaining power of suppliers and bargaining power of buyers).

It was decided to undertake this analysis in the context of a large, foreign brewer looking to enter the UK market. Though largely an arbitrary choice, the choice of Grolsch was swayed largely as they seemed to benefit from implementation of the M.M.C. proposals: before 1989 they had no direct U.K. presence, whereas in 1992 they acquired Ruddles Brewing Ltd. before entering a brewing and distribution joint-venture with Bass p.l.c. in 1994.⁵ Though the causality cannot be confirmed, this highlights how post-reform, Grolsch entered the U.K. market and as such, barriers may have existed initially which should be analysed. For purposes of comparison, the start date of analysis is 1989 and the end date is 2009.

1.2.1 Rivalry among existing competitors

The UK Beer Market had six 'Big Players' in 1989. These were Bass, Allied Lyons, Grand Metropolitan, Scottish & Newcastle, Whitbread and Courage.

As they all sold beer, a high degree of competition existed amongst them. However factions did exist between the types beer that they brewed. Also, Vrontis discusses how branding was considered very important to brewers, indicating minimal brand loyalty from consumers, which kept the environment competitive.⁶

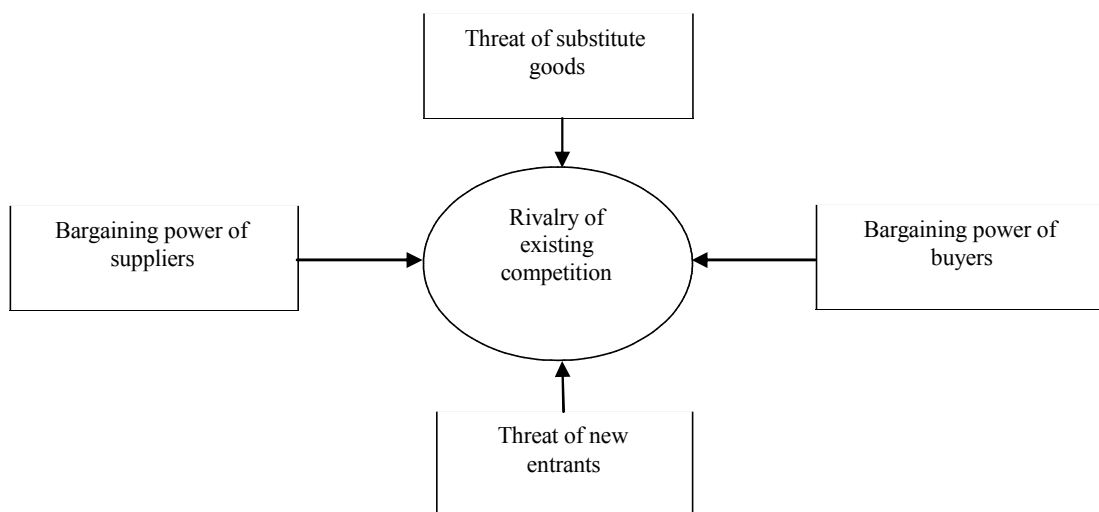


Figure 1.1: Graphical representation of Porter's Five Forces

By 2009, the make-up had changed somewhat, with Heineken N.V., Molson Coors Brewing Company and Anheuser-Busch InBev controlling 71.6% of the market.⁷ This again highlights the oligopolistic nature of U.K. brewing.

1.2.2 Bargaining power of suppliers

Brewers, especially the large ones, would normally be the largest buyer from their suppliers, meaning that they could exert a degree of monopsony over them. This is a trend across the market and would be faced by all players with minimal differential. The same can be said of the current situation.

1.2.3 Bargaining power of buyers

This is the defining feature of the late 1980s Beer Market. Buyers of beer were mainly public houses and of these 75% were in *tied trade* (see Table 1.2). This was where brewer exerted heavy influence over what and how beer was sold in pubs. As a result buyers had a

restricted amount of beer that they could buy which was of their own choice. If a house was linked to a brewery then they wielded a tremendous amount of power over what was ordered (often these agreements would be contractual⁸). If a house had ‘an agreement’ with a brewery, then the buyer was guaranteed to purchase a high proportion of their alcohol from that one source.

Those who secured tied positions with retail outlets were in a situation where the buyer was bound to stock their goods. With varying degrees of interrelatedness came different scales of how much control the brewer had over the running of the establishment.

Table 1.1 summarises the interconnectedness between brewers and outlets and the breakdown of these arrangements is shown in Table 1.2.

Therefore there is an ‘insider-outsider’ issue. Those within tied agreements could capitalise on those outlets which they were connected with continually buying their beer, whereas those without this option were forced to fiercely compete in the remaining Free Houses. Here, Grolsch would be considered an outsider,

| Premise owned by | Day-to-day running | Costs borne by | Revenues reaped by | Decision over products | Who keeps profit | Notes |
|------------------|--------------------|----------------|--------------------|---|------------------|---|
| Brewer | Brewer employee | Brewer | Brewer | Brewer | Brewer | Could be viewed as simply an extension to the brewery |
| Brewer | Tenant | Tenant | Tenant | Tenant - usually under obligation to brewer | Tenant | A close relationship involving training, alterations etc |
| Independent | Owner | Owner | Owner | Owner - sometimes engage in brewer agreements | Owner | Has some agreement with a brewer. Usually loan ties or restricted covenants |
| Independent | Owner | Owner | Owner | Owner | Owner | Completely free to trade and invest |

Table 1.1 Types of relationship between Brewer and Outlet circa 1989.

Source: adapted from (Monopolies and Mergers Commission, 1989).

| Public house type | Type (% total market) | % of sector | % of total |
|-------------------|-----------------------|-------------|------------|
| <i>Ties</i> | 75 | | |
| Managed | | 30 | 22.5 |
| Tenanted | | 70 | 52.5 |
| <i>Free</i> | 25 | | |
| Loan tied | | 25 | 6.0 |
| No ties | | 75 | 19.0 |
| Total | 100 | 100 | 100 |

Table 1.2 Market shares of Public House types circa 1989.

Source: adapted from (Slade, 1998).

owning no retail outlets and so faced extreme difficulty when it came to interacting with buyers.

By 2009, this explicit barrier had been removed allowing public houses the opportunity to purchase from a much broader base.

In the transition period after 1989 there was a decline in brewer ownership of on licences from 53 to 37%. The mass sell off presented an opportunity for other firms to expand their businesses, say, and set up pub chain houses. These chain houses bargained on wholesale terms with brewers, but owned the outlet independently meaning no rent was paid to the brewer.⁹ This increased Bargaining Power of Buyers in terms of their relationship with brewers.

1.2.4 Threat of new entrants

New entrants to the U.K. Beer Market faced a number of barriers. The barriers for a domestic, small scale entrant would be relatively small, whereas those wanting to expand and take over a large part of the market regularly struggled.¹⁰

Those engaging in the ‘export market’ i.e. brewing in their country and then transporting ready-to-sell beer (as opposed to the practice of brewing in the destination country) had to factor for the additional costs of trans-

portation. This posed a barrier to entry to penetrate the market, in addition to the limited destinations for their beer to be sold, creating a challenging scenario in which to enter.

The possibility of entering the market through owning a public house is addressed in *The Supply of Beer*. Requiring a full on-licence meant that it was difficult to set up a new outlet - ‘Entry to the market by opening a new public house is not therefore a characteristic of the United Kingdom beer market’.

The other major way of entering the UK beer market was licensing a beer through another brewer. *The Supply of Beer* notes how this was particularly popular for those with established brands in their domestic countries such as ‘Tuborg, Kronenbourg, Budweiser and Miller Lite’ which were brewed in the U.K. by the end of the 1980s.

By 2009, New Market Entrants would have found entry to the U.K. beer market less problematic than before, although there are naturally many stipulations to this point which would be impractical to include here. This topic is covered at greater length in [ch. 4.3.2].

1.2.5 Threat of substitute products or services

As shall be discussed later in [ch. 4.4.1], there was a steep increase in the number of available substitute

goods during the testing period. During the 1980s, beer encountered few substitutes compared with 2009. A rise in product innovation in the alcohol market has meant that beer faces greater pressure than before.

1.3 Summary

After the publication of the M.M.C. report, brewers and related groups underwent a period of lobbying which resulted in a less severe implementation of their recommendations. Nevertheless, these actions led to a drastic change to the way that the market operated.

The above analysis suggests that an oligopoly has continued to prevail in the U.K. Beer Market in 2009. Conceptually, 'chain houses' replaced the tied estate in the role of dominant buyer, reinforcing pressure on brewers. With this established, the existing literature shall now be examined, and the behaviour of cask ale brewers shall be introduced.

Chapter 2: Literature review

2.1 Introduction

In researching the canon of literature in the field of beer, a wide array of approaches and rationales for studying this topic were highlighted. Some looked at industry formation and the implications for merger policy, whilst others looked at whether the good should be taxed for government revenue purposes. Contemporary reports of the growth in the U.S. equivalent, craft brewing have been consulted, which can be used to draw parallels with the U.K. case. Many articles have highlighted the importance of advertising in the industry and finally a number of studies of what factors affect beer demand are looked at.

These key themes emerged as the best way to analyse the existing body of literature and serve as a sound way of establishing a solid platform to base this work on.

The majority of the literature on the subject of beer has been focussed on the U.S. market. Despite differences in the history of brewing in the U.K. and U.S., the product and consumer share broadly similar characteristics and so analysis of these studies is not in vain. For the

large part, discoveries about general beer demand found within these texts will be applicable to the understanding of how small U.K. brewers survive. With literature describing the specifics of the U.S. craft brewing movement, only tentative parallels can be drawn with the U.K. and so recent independent studies of this market are called upon to give more colour.

2.2 Determinants of industry set up

Moving then to the first key theme in understanding the beer market: the determinants of industry set-up. Early studies placed their attention on what caused industry concentration.¹¹

In one particular study,¹² attempted to establish whether a rise in industry concentration was beneficial or detrimental to the consumer, in doing so determining its causes. Lynk hypothesised two possible theories for why concentration may rise, the first being natural market evolution of successful firms displacing those that are less successful. Alternatively, rising concentration may have arisen through exclusion of small brewers by larger firms. This was most likely to manifest itself through regional outlets becoming pressured to sell only certain brands of beer and, with more might behind them, the larger brewers hold a credible threat of withdrawal meaning that smaller brewers would become forced out. Interestingly, Lynk notes, in reference to the U.S. beer market, that 'with trivial exceptions, beer producers, wholesalers, and retailers are independent operations'. Certainly before the time of the Monopolies & Mergers Commission Report of 1989, this was not the case in the U.K., with deep vertical integration throughout the industry. As the market has evolved, stemming from the resulting policies, there is presently less formal integration within the supply chain and so the analysis presented by Lynk here becomes more applicable.

Around this time there was a general thread of study, which looked indirectly at concentration, to answer how both large and small firms competed and survived in the same industry. Caves & Porter hypothesised that, with the existence of mobility barriers between markets, groups in the same industry can face different demand and cost functions.¹³ This issue was applied to brewing by Tremblay, analysing the persistence, of both national

and local brewers.¹⁴ In his study of strategic groups in the U.S. beer market, Tremblay found that a national group had been established, implying that smaller brewers were restricted from entering. This theory can be applied to the UK beer market too, with heterogeneous products: lager, ales and stouts persisting (albeit in varying proportions) for the past 50 years.¹⁵

Moving to the concentration of the wider beer industry, Tremblay, Iwasaki, and Tremblay describe how the U.S. market, as a whole, saw a huge rise in the concentration of the four largest members, with the CR4 ratio rocketing from 44% in 1970 to 98% in 2003.¹⁶ A similar rise in concentration has been noted in the UK by Slade.¹⁷

Honing in on the micro sector of the market requires an alternative theory. Studies into the movements of firms in new markets focus on entry, exit and informational feedbacks.

The area of industry population dynamics is broad and incorporates many theories. In light of staying pertinent just a couple of articles shall be mentioned, despite appreciation of many more threads of research existing.¹⁸

Geroski & Mazzucato and Howarth, Schivardi, & Woywode in particular present theories of industry population dynamics, looking generally and then specifically to the brewing industry.¹⁹ Their pattern of a sudden rise in firm numbers preceding a sharp decline is certainly relevant to U.K. beer market.

Howarth, Schivardi, & Woywode analyse the U.S. brewing market and, despite their testing period being over a hundred years ago the theoretical model offers an intuitive explanation for characteristics that bear resemblance to the U.K. beer micro market today. The logic follows that uncertain, yet risk-taking entrepreneurs enter a new market with insufficient information to know of their venture's profitability. As profits eventually rise and this information is relayed to other agents, they too enter the market. With a flood of new agents operating in the market, those who were the 'first mover' held the advantage and the firms who delayed eventually perish; in the brewing study this especially happened within 1-5 years of entry. The industry therefore 'shakes out' excess numbers and returns to a sustainable level. Geroski & Mazzucato complete a

similar exercise on the U.S. car making industry, presenting various methods of how to model this, reaching a similar conclusion.

A further theoretical model that can be used to interpret the U.K. beer market is the Chamberlin model of monopolistic competition. In industries where non-price competition exists, there will be excess capacity in each firm and insufficient productive capacity in the industry, due largely to under-utilised economies of scale.²⁰ Koutsoyiannis explains the intuition behind this model.²¹

Individual firm demand is relatively elastic compared to industry demand. When competing on price, they will produce close to the Minimum Efficient Scale, however if instead the market engages upon non-price competition then the price in the industry will rise. This is because firms abandon their individual curves and focus instead on maximising their market share. As more firms engage in this, the industry demand curve shifts to the left, with the optimal point occurring with tangency to the Long Run Average Cost Curve. At this point, economies of scale are not maximised and, assuming free entry to the market, this means that start up firms can enter and become profitable, despite the relatively high costs. Consequently there is a rise in market entry, with high prices and small firms competing on non-price characteristics.

There are a number of assumptions with this model which mean it may not be considered wholly applicable, however there may be a case for suggesting that the U.K. real ale market exhibits the characteristics put forward in this model. This will be discussed later in [ch. 4.3.2].

2.3 Small brewer literature

From looking at theoretical models, the second theme focuses purely on the characteristics of beer and, in particular, smaller brewers. Once again, a large body of text exists looking at U.S. brewing and for the purpose of clarification, the comparable US small brewers are named 'craft brewers'.

To begin, characteristics of craft beer and brewing are given, as described in Kleban & Nickerson, to establish

a stronger foothold on what is being discussed.²² Craft brewers focus on differentiation, deriving their value through traditional styles of brewing and adding unique mixes of other flavours. Craft brewers engage in locality not only on the supply side, but also demand through involving themselves with the local community and are generally horizontally differentiated with a limited amount of substitutes. They compete and differentiate with normal beers through distinctive taste and superior quality, this being the main reason for them differentiating horizontally as competing on price is not possible due to the extensive economies of scale that larger brewers can utilise.

Despite similarities in the markets today, the roots of small-scale brewing, as noted in *Datamonitor*, are very different.²³ The U.K. had seen a long decline in small scale brewing since World War II, but then with the start of the Campaign for Real Ale (CAMRA) and the government introducing the Progressive Beer Duty (P.B.D.) in 2002, smaller brewers have been stimulated and the number of total brewers has rocketed from 87 in 1975 to 767 in 2011.²⁴

By contrast, the U.S. has less of a culture of homebrewing in part due to the prohibition era of the 1920s and 1930s. The emergence of craft brewers was borne out of tiredness with bland, corporate lagers and has followed a similar explosion in numbers.

Much has been made of the recent upsurge in not only the number of small brewers in the U.S., but also the counter-trend rise in demand for craft beers. As explained in Kleban & Nickerson, beer sales by volume in 2009 were down 2.2% in general, imported beers down 9.8%, yet craft beer saw a rise in volume of 4.3%. In the UK, there has been a trend of cask ale's share of the total on-trade beer sold increasing. In 2006 it was 12.4% whereas 2010 it stood at 15.0%, rising each year as reported by Brown citing B.B.P.A./H.M.R.C. data.²⁵

What are the reasons for this growth in a declining market? Carroll & Swaminathan attempt to answer this directly and echo Peterson that 'consumers might be reacting against mass society, its production techniques and its corporate organisations'.^{26 & 27} The desire for consumers to choose local, authentic brewers arises from interviews that the authors have held with large brewers.

In a report examining how these larger brewers can capitalise on this changing trend, *Datamonitor* notes how there has been a move for consumers to opt for 'less of the best' when it comes to craft beer, choosing to 'trade up but drink less'.

Another avenue that craft brewers are exploring is the food and drink market. An industry report noted how there has been a rise in U.S. restaurants embracing beer and encouraging customers to match tastes and flavours. In it, Scarpa includes interviews with restaurateurs describing how they are seeing differences in consumer behaviour when it comes to selling beer.²⁸ Craft beer is benefiting because consumers don't wish to drink a bland lager with their meal; one director neatly summarised the situation whereby their wine-orientated restaurant has gradually begun stocking craft beer: 'It's to the point that the better I make the beer list, the more beer I sell'.²⁹ Like other restaurants, they have 'gradually replaced familiar premium brews with unusual offerings'. One such owner talks of how 'people share them like a bottle of wine'³⁰ whilst another in the industry³¹ states how consumers have become a lot more knowledgeable and as such are no longer asking 'the difference between lager and ale' but instead intricacies between the types of yeast that are used.

This represents an opportunity for craft brewers in the U.K. too, and there is evidence that a similar movement has begun³² and the introduction of an accredited Beer Sommelier Scheme. The area of expanding into restaurants is one that real ale brewers can capitalise on as their main differentiating factor over national lagers is taste. Due to the idiosyncratic ways of brewing that allow a plethora of flavours and styles to be brewed, craft brewers can produce an array of beers that restaurants will want to stock to match with their food. Some have also adopted the 'brewpub' format³³ where only beer that is brewed on site is used at the restaurant.

As alluded to earlier, much of the formal analysis on the U.K. beer market focuses more on the large brewers, their make-up and control of brands in the industry. Specifics to the real ale movement most likely come from industry, or sub-sector publications and so naturally have a slant on portraying their area in a positive light. Nonetheless, organisations such as CAMRA provide a wealth of literature cataloguing the real ale trade which proves invaluable for researchers.

2.3 Advertising

Returning to the academic realm, the third theme of advertising is prominent in studies applied to the brewing industry. Intellectual interest began in earnest in the U.S. after the introduction of the television and the newfound ability for brewers to connect beyond their immediate region.³⁴ Early studies used the post-war era to analyse these effects, the seminal study being Greer.³⁵

In the early 1970s, Greer looked at how advertising expenditure may foster industry concentration. The logic goes that with increasing returns to scale on advertising expenditure Horowitz & Horowitz larger firms can maintain greater advertising, in relation to sales, than smaller firms.³⁶ With this 'game' of high advertising expenditure, firms don't wish to decrease their expenditure causing unskilful advertisers out of the market. This stimulates them to merge with one and other, increasing industry concentration.

The issue of advertisements' relevance in determining industry structure is hotly discussed in an exchange of articles during the 1980s with Lynk,³⁷ Tremblay,³⁸ and Lynk.³⁹ After Lynk offered up two hypotheses for causes of high concentration, Tremblay argued that firms' use of advertising deserved more credit for causing a rise in concentration. To this, Lynk rebutted that Tremblay's analysis may have only served to highlight that the role of advertising had simply transferred from retailer to producer, thus explaining why those who advertised heavily received a higher price per barrel than those who didn't.

Scherer⁴⁰ investigated this area and concluded that a more important factor in the change in industry concentration is an intensification by market leaders to increase their industrial capacity, whereas McGahan, in looking at the causes for U.S. brewing oligopoly, noted that

[large brewers] could no longer rely on capacity constraints to prevent dissipation of profits through price competition', instead the 'leaders therefore developed national advertising presences ... [that] would constrain competition.'⁴¹

Another tangent for the role of advertising in the beer market is whether it expands the industry as a whole or just shifts market shares. It is useful to discuss whether

advertising stimulates demand in an industry as a whole, or whether it just redistributes it between existing firms: is it predatory or cooperative.

Baker & Bresnahan⁴² find that advertising doesn't affect the overall demand for beer in their study on three large U.S. brewers, whilst Duffy⁴³ finds a slight positive effect when investigating the U.K. case. Walsh⁴⁴ too finds 'that beer advertising tends to stimulate beer consumption albeit partially at the expense of spirits and wine consumption', which leads to Nelson⁴⁵ who suggests that a substitution effect between different forms of alcohol advertising may exist, finding that a reduction in spirit advertising causes a positive, yet statistically insignificant, increase in beer demand.

We are therefore inconclusive on the effect of advertising on the overall demand for beer. If we were to take a positive view on the matter, consistent with Duffy and Walsh (who both investigated the U.K. market), then this becomes important for small U.K. brewers. If large brewers are advertising themselves heavily, then the whole beer sector benefits at, say, the expense of wine or spirits. This may have positive externality benefits for craft brewers as consumers experiment within the beer sector, boosting their sales.

Whilst these focus on traditional methods of advertising such as television and radio expenditure, this perhaps could no longer be sufficient for analysing the effect of advertising on the brewing industry. Within the literature it was found that consistently only large national brewers were being analysed. Studies from Greer⁴⁶ and Horowitz & Horowitz⁴⁷ explain how for brewers to succeed, high advertising revenue is needed and that advertising exerts increasing returns to scale. In 2009 SIBA reported, in reference to small UK brewers, an 'average of 4.5% of turnover is dedicated to the full range of marketing tools', compared to a widely accepted truth it is much higher for large brewers who advertise worldwide, this highlights how the relevance of traditional advertising becomes diminished in the current case.⁴⁸

Academically, Ling, Lawler, McBain, & Moscardini note the importance of internet advertising and how this issue has become particularly relevant for small UK brewers.⁴⁹ In looking at industry reports by the Society for Independent Brewers for 2010 and 2011 the impor-

tance of online marketing becomes apparent. They note that ‘57% of local brewers now use social networking (Facebook, Twitter, etc.) as a serious and very efficient marketing tool’ as well as more directly confirming this point; both years have ‘website & online’ taking priority over ‘advertising’ in respondents’ marketing budgets.⁵⁰

A consideration of internet advertising and craft brewers is initiated by Clemons, Gao, & Hitt who look at the role of websites offering consumers the opportunity to rank beers that they have tried.⁵¹ Although this is not a direct marketing tool undertaken by small brewers, it nonetheless demonstrates how consumers of their good are willing to engage in online activity which is something many brewers have begun to harness.

2.4 Factors affecting beer demand

Moving to the final theme in this literature review, we now look at what factors have been considered as appropriate for analysing beer demand

A useful place to begin is Fogarty as he undertakes a broad survey of the alcohol demand literature.⁵² Fogarty brings together literature spanning over 50 years to compile a meta-study in the subject matter. This often aggregated beer studies with those of general alcohol but nonetheless, some salient points are made which are worth consideration. It further acted as a portal into a number of key ideas in the literature.

The first to consider is the possibility of undertaking a rational addiction hypothesis, akin to Becker & Murphy.⁵³ Here the authors factor in a demand model whereby previous consumption of the good promotes future consumption which continues over time. However, despite this being arguable for some types of alcohol, real ale does not appear to carry the same characteristics.⁵⁴

Within the literature there is a description of the evolution of statistical models that have been used. The focus of this section is not to find the most effective form to model beer demand, rather to discover an econometric structure that can adequately answer what changes may have occurred. Consequently, a thorough analysis of different statistical methods is unnecessary.

Back to the literature at large, Penm looks at the different containers that beer is packaged in and finds that this has a significant effect on how beer is consumed.⁵⁵ This would prove a useful exercise when examining U.K. brewers; however data restrictions render this inapplicable for the present study. This would have been possible had the good itself been homogenous and produced in various containers, say a multinational lager, however as many small U.K. brewers produce relatively little, it is understandable that this kind of analysis must go amiss.

An article that addressed some of the factors that affect beer demand is Culbertson & Bradford, yet their primary focus is identifying the causes of price differentials between US states.⁵⁶ This requires a breadth of variables to explain the diversity between states. One such anomaly was that certain states had laws that entitled consumers to a refund if they returned empty bottles. During the period of study in my U.K. case, this law has not been in place. As such this merely contributes to the overall understanding for what should be considered for analysis on beer demand.

Koksalan, Erkip, & Moskowitz discuss the Turkish market.⁵⁷ With motivation from private brewers they try and discover a host of factors affecting beer demand. The model has benefits as it took a commercial point of view, confirming accuracy of data and adopting a combination of academic and practitioner opinion. This contrasts with Ogwang & Cho who instead are motivated by advising the government on how to curtail alcoholic consumption of these beverages.⁵⁸ However, included in the Koksalan, Erkip, & Moskowitz model are variables that are irrelevant for a U.K. model: climate, tourism, and the month of Ramadan. The Turkish market is therefore somewhat incomparable with the U.K. small brewing industry, although once again it added to the overall picture of beer demand.

Of the studies analysed, Hausman, Leonard, & Zona displayed desirable properties for a model of U.K. beer.⁵⁹ Their approach to the demand for differentiated products and their elasticities allows for multiple product types, akin to lager, ale, stout etc. Whilst this would prove to be of interest, data restrictions on the U.K. case prevent this from being a viable avenue of study for the time being. This is further discussed in [ch. 3.9].

Abbott, Lawler, & Ling provide a long term demand function for beer in the U.K. market.⁶⁰ Using the three factors of real disposable income, price index for beer relative to all other goods and a price index for beer relative to other alcoholic substitutes, the authors run a time series for the U.K. beer market between 1984Q1 and 1994Q1.

During the period of this analysis, craft brewing saw the continuation of its renaissance in the U.K. With the subsequent explosion of new small brewers, this presents itself as an ideal opportunity to compare the results of Abbott, Lawler, & Ling with updated data and measure what affect, if any, the craft sector has had on the U.K. Beer Market.

This is the most appropriate method to use as a baseline from which to measure the current beer market as it contains what the literature has shown to be the three most significant variables that affect the demand for beer. Their analysis was on the U.K., meaning that any cross-country factors need not be considered. Further they consider the aggregate output of beer, rather than a narrower focus on, say, the container that it is consumed, meaning data comparison can be much more accurate.

2.5 Summary

To conclude this chapter, a number of pertinent points have been extracted from the current body of literature. The U.K. beer market could be applied to Chamberlin's model of monopolistic competition, the small brewer sub-sector may display further similarities with U.S. craft scene, and an appropriate method for modelling the long run demand has been found in Abbot, Lawler, & Ling. Greater certainty on these issues is developed in [ch. 4.3.2].

Chapter 3: Data analysis

3.1 Summary

This chapter serves to give a brief overview of the data analysis section of the study. For a fuller explanation of the steps of the statistical regression, as well as how data from primary and secondary sources were gathered, refer to Appendix 4

After discussion in [ch. 2.4] the functional form, or type of equation, used to examine the demand for beer is the double-log method. This has the benefits of being consistent with the existing literature, and a having simple interpretation.

The data used is also consistent with previous studies, and from reliable sources, allowing a robust comparison to be made.

The main issue that need to be considered in terms of how the data behaves is a known as stationarity. In the example of beer, the levels of each variable (quantity of output, income, price of beer, and price of substitutes) are taken at the end of each quarter in a given year. Stationarity tests whether there are any changes that may occur due to, say, seasonality, that won't be picked up in changes in the variables.

For example, in the fourth quarter of every year, the level of beer output may increase because of a surge in Christmas sales.

In statistical terms, this wouldn't be because of a change in any of the inputs (the price of income doesn't rise in Q4 meaning more people buy beer, say) and therefore will be a result of an independent factor.

A number of statistical processes are undertaken to test for the presence of this stationarity, and also deeper complexities that are required to give the model rigour. The resultant equation passes these tests allowing the model to be interpreted free of statistical apprehension.

The Long Run model for Beer Demand in the U.K. can be interpreted as:

$$Q = 2.26769LY - 4.57367LPb + 0.80701LPs$$

Chapter 4: Results

4.1 Introduction

This chapter interprets the statistical results of the updated U.K. beer market model and places it within the existing body of literature. Further, it absorbs the additional data that has been collated, and presents the

findings in the context of the existing Chamberlin model (explanation is given in section 4.4). When discussing the implications for the U.K. beer market, analysis of large brewers isn't considered; instead focus is drawn to the small, cask ale brewers which this paper set out to explore.

Translating the Long Run model we have just found, we are able to say that: for a 1% percentage in income, the quantity of beer demanded will increase by 2.27%, holding other variables constant.

A 1% percentage increase in the price of beer compared to all other goods will cause a decrease in the quantity of beer demanded by 4.57%, and a 1% percentage increase in the price of beer compared to all other goods will cause a decrease in the quantity of beer demanded by 0.81%. In all these cases, other factors must be held constant.

The percentage change of income, the price of beer, and the price of substitutes can also be termed as elasticities. In this instance, the percentage change is relative to the quantity demanded, and therefore is referred to as the elasticity of demand.

4.2 Discussion of results

It is necessary to compare this finding with what is already present in the current literature.

Due to the way that the equation has been set up, (i.e. a double-log model), the coefficients of the variables can be interpreted as the elasticity of demand.

Elasticity of demand

The elasticity of a product, in this example, means how sensitive the input is (i.e. income, price of beer or price of substitute goods) is to the level of output (volume of beer). The level of elasticity is always measured in absolute terms.

A product is said to have a higher elasticity of demand if the coefficient is greater than one. In the case of the U.K. beer market, this is income and price of beer. What this means is that if, say, income increases by 1%, the

resultant change in quantity of beer is more than 1%.

The relationship of each variable with the level of quantity demanded is known as an elasticity of demand. This is income, own-price, and cross-price, and measures the percentage change in income, the price of beer and the price of substitutes respectively.

Each of the variables will be discussed in greater length in the subsequent sections.

When interpreting these results, the existing literature will be consulted for markers on the appropriateness of the findings, but also to support some of the implications. Beyond this, the viewpoints gathered from the primary data collection will give further credibility to discussion.

4.2.1 Income elasticity

The question of whether beer is a normal good is the most contentious of the three variables, in the literature. A normal good is one where, as the level of income in the economy rises, the quantity of the good demanded increases. In terms of elasticity, it is represented by a positive sign.

Earlier in [ch. 2.1], it was accepted that the consumer habits of beer drinkers internationally⁶¹ were largely the same. As such, it is suitable to compare studies that have been undertaken in these countries, to broaden the scope of potential sources.

Studies throughout the literature yield no definite conclusion on what effect income has on the quantity of beer sold; for example Hogarty & Elzinga⁶² examined the U.S. demand between 1956-9 whilst Clements & Johnson studied Australia between 1955-77.⁶³ Both found beer to be a normal good, with income elasticities of 0.59 and 0.80, respectively.

Studying the U.K. from 1956-75, McGuinness concluded that he must 'accept a result which implies that the effect of income on consumption is not significantly different from zero'.⁶⁴ Similarly, Ornstein & Hanssens find that 'income is unrelated to beer consumption'.⁶⁵ However, their research in the U.S. includes variables such as the state's religion and also its legal drinking age which are unnecessary in the U.K. case.

Finally, there have been some studies that concluded beer to be an inferior good. An inferior good is one where, as the level of income in the economy rises, the quantity of the good demanded decreases. In terms of elasticity, it is represented by a negative sign.

Between 1974-80 Lynk found in the 38 U.S. states, the income elasticity to be negative.⁶⁶ Further, Tremblay, using pooled data from 1950-77 stated: 'Results here imply that beer is an inferior good', whilst also noting that 'this may not be true of particular brands'.⁶⁷ This is an issue that will be discussed in [ch. 4.3.2].

4.2.2 Own-price elasticity

In keeping with economic theory, the sign of elasticity for beer is negative. Where this differs from the majority of other studies is that it implies that beer is an elastic good; it's measure of elasticity is -4.57 (i.e. absolute number is greater than 1).

When examining the existing literature, a number of different values for the own-price elasticity were found. These findings have been taken solely from the U.K., which will arguably increase the relevance and comparability with the present study.

Three main studies were completed during the 25 years from the mid-1950s to the late-1970s. Walsh,⁶⁸ McGuinness,⁶⁹ and Godfrey⁷⁰ found the own-price elasticities to be -0.13, -0.30 and -0.14, respectively. This clearly points to beer displaying the characteristics of an inelastic good, whereby a large change in its price is required for a change in the quantity demanded.

More recently however, Abbott, Lawler, & Ling⁷¹ and Moosa & Baxter⁷² have found beer in the U.K. to be an elastic good. It would seem that the current results fit with this more up-to-date trend.

4.2.3 Cross-price elasticity

There are a few issues that need to be considered when assessing the cross-price elasticity of demand for beer. Firstly, and most simply, which goods should be considered as a potential substitute? The literature has come to a consensus that the three, core alcoholic groups can be

summarised as beer, wine and spirits. Some studies that analysed the demand for alcohol often grouped these together as one commodity, for example McGuinness implicitly making all three substitutes with one and other.⁷³ Others, such as Duffy reported the groups individually and found beer to be a substitute with wine and spirits individually.⁷⁴ Johnson & Oksanen too report a regression and find wine to have an elasticity of -0.121 and spirits at -0.042.⁷⁵ Heien & Pompelli find beer to have own-price elasticity of -0.84, -0.21 with wine and -0.09 with spirits.⁷⁶

Many of these studies have focussed on the demand for alcohol as a whole and as such present beer, wine and spirits as individual variables. However, with the present task being to model what changes may have occurred in the long run demand for beer, it is in keeping with Abbott, Lawler, & Ling that wine and spirits are grouped together as the substitutes for beer.⁷⁷ Further, when assimilating data, the O.N.S. provided an index for 'alcoholic drinks: wines & spirits' indicating that it is appropriate to group these goods together.

4.3 General implications

From these results, a number of implications can be drawn.

4.3.1 Implications of relationship with income

Firstly, that beer can now be considered, economically speaking, as a 'luxury good'. This merely indicates that, unlike previous studies, it has been found that income is now a large determinant on how much beer is demanded, whereas before other factors accounted for its volume.

4.3.2 Implications of relationship with substitutes

The second main point to take away from this is how beer has become a much more elastic good since the three studies by Walsh, McGuinness and Godfrey. There are a number of reasons why this is the case. For this sub-section, it was chosen to look beyond economic studies into reasons for the decline in beer demand, utilising the sociology literature. This captured an interpretive, qualitative perspective which supported the

existing, more objective and quantitative sources that have been used.

Firstly, there has been much written about the core beer drinker originating from a traditional, heavy-industry community and how the two have seen a decline together Gofton.⁷⁸ With the erosion of labour intensive employment, especially in the North of England, the working class labourer no longer regularly frequented the public house to consume his beer. Indeed, 'Beer drinking and the public house fitted into the discipline of industrial work'.⁷⁹

There was also a change in the consumer profile of public house operated for. As pubs began to open their doors to a wider audience, the variety of alcohol that they offered broadened too. Mintel writes of 'a gradual replacement of this mixed-age, single-sex customer base ... leading to a growing differentiation of the alcohol market'.⁸⁰

Measham & Brain view this transformation from drinking beer to other alcohol types as a move from 'an industrial to a post-industrial order'.⁸¹ Though viewed from a slightly different perspective they highlight a few key reasons for the decline in beer drinking and rise in popularity of other drinks. Firstly, 'alcohol became recommodified', introducing a new era of 'high strength bottled beers, ciders, lagers and fortified wines', 'ready-to-drink spirit and mixers (R.T.D.s)', 'flavoured alcoholic beverages (F.A.B.s)' and later "'buzz" drinks containing legal stimulants such as caffeine or guarana'. Secondly, wine and beer became up to 50% stronger to compete in the 'psychoactive market'.⁸² Thirdly, alcohol was advertised as a lifestyle marker to appeal to market niches, again moving away from traditional beer drinking. And finally, there was an overhaul of the establishments that alcohol was consumed in, with an increase in cafe bars and other alternatives. This was coined the 'On Trade revolution'.

This all provides a picture of the changing scene of alcohol consumption in the U.K. The traditional, insulated safe-haven of the public house and the beer-drinking male meant that beer, with at the time relatively few substitutes, behaved as an inelastic good. Once these doors were prised open, an influx of new drinks and new drinkers bombarded the established routine. With a rise in substitute goods and a decline in the core con-

sumer, beer could no longer claim to sit on a pedestal and had to survive in a much more competitive market. This inevitably led to it having a much higher own-price elasticity of demand than before.

Having assessed the varied reasons for the increase in beer market competitiveness, it is time apply these findings to a theoretical model. As mentioned in [ch. 2.2], the current standing of the U.K. beer market will be analysed in the context of Chamberlin's model of monopolistic competition to assess how applicable it is.

4.4 Chamberlin's model

4.4.1 Characteristics

The characteristics of the model are laid out by Hart⁸³ to feature:

1. Many firms producing differentiated commodities
2. Each firm is negligible, in that it can ignore its impact on, and hence reactions from, other firms
3. Free entry leads to zero profit of operating firms
4. Each firm faces a downward-sloping demand curve and hence equilibrium price exceeds marginal cost

The U.K. beer market will be assessed to see how well it fits this model, with particular attention to small brewers; the focus of this study.

Firstly, it is clear that the beer market is characterised by many firms producing differentiated goods. With the number of breweries in the U.K. having risen to 767 by 2011, this represents a high degree of differentiating potential, especially as craft brewers aim to produce diverse array of beer with a different flavours. As noted by the SIBA report of 2011 there was 'the possibility that 6,000 different cask beers were produced last year' compared with 304 35 years ago.

Secondly, certainly in terms of smaller brewers, their influence on each other will be minimal. Each brewer will be trying to produce as much as possible to sell to the market and won't be in a position to exert meaningful influence over their competitors.

Lastly, it is more than plausible to see cask ale brewers making a small, if negligible, profit from the beer they

produce. Larger brewers in the U.K. market: Heineken N.V., Molson Coors Brewing Company and Anheuser-Busch InBev, will not meet the second and third criteria as they operate on such large scales that the effect of their output decisions is greater than negligible. Further, their profits are in thousands of millions.⁸⁴

Heflebower asserts that ‘Chamberlin concluded that where entry is easy the number of sellers of a good would be enhanced by non-price competition’.⁸⁵ It has already been established that the introduction of Progressive Beer Duties eased the entry of small brewers into the market and led to a subsequent influx of new firms. The increase in number of different brews is also indicative of a rise in non-price competition.

It has therefore been established that the market for small brewers has met the Chamberlin specification, the next section will look at how this will affect the sub-sector.

4.4.2 Implications

One of the major implications of the theory is that excess capacity will occur. This issue is considered important for its welfare implications, however this is not the setting to rekindle the debate, merely check its applicability. It is agreed that large brewers can produce beer for less than cask ale brewers can. Simple logic would suggest that if these assets were pooled and utilised, then output of beer would increase in the market, implying that excess capacity exists. Further, in response to survey question on how ‘Total Costs would be affected if production increased 50%’ all the responses were less than 50%, pointing to the minimum efficient scale not being met. One respondent even answered ‘Fixed costs will stay the same as we have enough capacity to absorb this’.

4.5 Large brewer involvement

A sequential question to ask from this then, is why don’t large brewers exploit their economies of scale, produce cask ale cheaper than smaller brewers and earn the profits for themselves? Drawing on various sources to help answer this, it becomes apparent that it would be very difficult for a large U.K. brewer to succeed. As men-

tioned in the [ch. 2.3] Carroll & Swaminathan try to ascertain the reasons for the U.S. microbrewery revival.⁸⁶ In doing so, they document the response from mass producers to the resurgence in small brewing and despite only paying attention to the U.S., their rationale will still be applicable to the U.K. case. They note that, ‘Despite their vast resources and immeasurable technical expertise, these efforts have, for the most part, been met with limited success’.

One of the key reasons for this is that consumers of craft-style beer display animosity towards mass producers. They further raise the question of why consumers decide ‘to purchase on the basis of organisational form identity rather than product characteristics’ drawing upon a study that found that these consumers ‘think that all [products brewed by a particular brewery] taste the same, and [their] mind is closed’.⁸⁷

That drinkers won’t purchase from a brewer because of their size therefore presents itself as a commercial barrier to entry into the cask ale market. From an operational perspective, the two brewers interviewed for this paper both held the opinion that cask ale can’t be successfully brewed by mass producers and when asked about this, they responded: ‘I don’t think they can do it, I think they’re too big. It’s like the Titanic, it can’t move quickly can it. Whereas we can duck and dive, we can be very reactive’ (Brewer 1). Further, ‘They do say that when a brewery gets big, the quality changes. And it does’ before explaining how beer brewed on a large scale has, to some extent, lack flavour in order that it is ‘offensive to nobody’ (Brewer 2).

Moving then under the premise that it is only small brewers participating in the cask ale market, Chamberlin’s theory is now consulted to assess whether the present situation is in an equilibrium state, or whether the market will adjust to exploit these inefficiencies. These adjustments manifest themselves through firms leaving the market, in a similar fashion to the ‘shake out’ described by Howarth, Schivardi, & Woywode in [ch 2.2].⁸⁸ Chamberlin’s opinion on this is provided by Ireland in that ‘too many firms each supply too little output’ and that ‘a rise in costs tends to squeeze out some firms and reduces this problem’.⁸⁹

It is likely that input costs will rise which would imply that the number of firms in the market will fall.

Supporting this case is one craft brewer whom I interviewed who described his view on whether having more entrants is sustainable as follows ‘there’s got to be a limit, the bubble’s going to burst’. In more detail he explained, ‘the market’s still quite small, only so many pubs in the area can have our beer ... if there are more breweries and somebody else is on the bar - we’re not’. When describing the present outlook for cask ale producers, (Brewer 2) summated the competitive nature as: ‘we’re in a special niche market, but we’re competing now because there are a lot of up and coming breweries that are just starting to do the same thing’.

4.6 Strategies adopted by cask ale brewers

The different strategies that have been adopted by these small brewers to survive in the marketplace shall now be discussed.

Mainly direct sources were utilised in order to fully appreciate the intricacies of small brewer operations, described in [ch. 3.10] rather than rely on general strategies that may be reported in the academic literature.

One of the key themes that emerged, beyond focusing on quality, was brewers associating themselves within their local region. On the survey question on how small brewers differentiated themselves, the responses gained included: ‘Locality, provenance and customer service’, ‘Local orientation, such as beers named after old Wiltshire dialect’, ‘Quality of our beers’ and ‘Local products & good service’.

This aligns with Peterson that consumers wish to kick back against mass society.⁹⁰ Further, this fits into the ‘New Villagers’ movement highlighted by Brown whereby consumers are beginning to actively support their local economies.⁹¹ Other ways of doing this have been through promoting brewery tours to get people interested locally (Brewer 2).

In terms of marketing, the 2011 SIBA report highlights the extent to which small brewers have utilised social media: ‘57% of local brewers now use social networking (Facebook, Twitter, etc.) as a serious and very efficient marketing tool - not far off double the 32% reported in last year’s survey’. This provides them with

a platform to connect with more consumers.

On innovation and development of new products there is no definitive consensus. (Brewer 2) talks about the flood of new styles being adopted in America and how they ‘are actually starting to do a lot more in that vein’, whereas (Brewer 1) instead focuses more on brand building of their existing brews. Many of the responses in the survey alluded to periodically brewing different seasonal beers.

Brewers large and small try to reach out and tap into new markets. It is well documented that attracting women to beer would be profitable and hasn’t been done yet,⁹² with some brewers actively engaging in female-orientated marketing events.⁹³ Another area that has been explored is associating with restaurants and matching food with beer, comparable with the movement that has occurred in the U.S., cited in [ch 2.3].

4.7 Interaction with industry groups

This is not necessarily a differentiating factor, yet still an important consideration in small brewer survival. Organisations CAMRA and SIBA have established themselves as lobbyists for the beer industry with the BBPA reporting how both continue to fight for the preservation of P.B.D.’s, something that will affect small brewers immensely.⁹⁴ Though there is the possibility of positive bias in their results, in 2011 SIBA reported that from their annual survey, 81% of respondents believe that ‘[P.B.D.’s] permanent retention is essential to my business’.

Through their lobbying, SIBA and CAMRA look to promote the best interests of small brewers on a national level. Whilst control over differentiating from rivals, product innovation and quality measures can be mostly achieved through the decisions that the firm makes itself, this highlights how powerless most brewers are to changes that happen at a national level.

Though not possible to quantify, it should be remembered that a large part of the survival of cask ale brewers remains out of their control. If legislation, such as an abolition of P.B.D.’s, is introduced then the evidence would suggest that the survival of small brewers is in peril, regardless of whether they implement the strategies mentioned above.

4.8 Summary

This chapter has found that the wider demand for beer has become much more sensitive to both income and its own-price as a result of a decline in traditional beer drinkers and an explosion of alternative products acting as substitutes. This shows how beer as a commodity is now operating in a fiercely competitive market and that its volume has been steadily declining.

Within this setting, cask ale has seen a revival, both in consumer demand and entrants to the market. It has been established that, for now at least, the provision of real ale is reserved for small brewers, however with a huge increase in the number of breweries opening this has led to heightened competition to supply the market. As a result, a number of innovative techniques have been employed to ensure route to market.

The looming threat of P.B.D. removal casts further doubt on small brewers' survivorship which may uniformly raise costs and wipe out a large portion of the market. Organisations SIBA and CAMRA have strived to mitigate these implementations, however prediction on legislation outcome should be left to the fool-hardy.

Chapter 5: Conclusion

This dissertation has looked to answer how UK small brewers survive in the context of an evolving market for beer.

Small brewers have reacted to being in a much more competitive market through product innovation and tapping into a revived consumer interest in localism. Establishing this differentiation has involved approaching new markets that mass produced beer has struggled to conquer.

Cask ale brewers in the U.K. rely heavily on P.B.D.'s. If removed, it is foreseeable that the majority of the sub-sector would perish.

This paper has presented an up-to-date model for the long run demand for beer in the UK, which has found beer to be a much more elastic good than previously found. This is has been supported by qualitative find-

ings also. Further, it has displayed strategies that small brewers have adopted in order to survive.

The research has shortcomings in that more primary data could have been gathered to enrich the analysis undertaken. The main constraint with the lack of brewer response was time; these are often small operations who cannot afford the hours to devote to academic research.

In summation it seems that despite the glamour associated with owning a small brewery, the U.K. beer market is a tough one for brewers to survive in.

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References

1. (Monopolies and Mergers Commission, 1989), referred here as *The Supply of Beer*.
2. *ibid*.
3. Slade, M. (2010) 'Competition policy towards brewing'. In J. Swinnen (ed.), *The Economics of Beer*. Oxford: Oxford University Press.
4. Porter, M.E. (2008) 'The Five Competitive Forces that shape strategy'. *Harvard Business Review*. pp.78-93.
5. *The Independent*. (25/02/1994). Bass in joint venture with Grolsch for distribution. Retrieved 03/03/2012 from: <http://www.independent.co.uk/news/business/bass-in-joint-venture-with-grolsch-for-distribution-1396350.html>
6. Vrontis, D. (1988). 'Strategic assessment: the importance of branding in the European beer market'. *British Food Journal*. pp.76-84.
7. Datamonitor (2010) *Beer in the United Kingdom*. London: Datamonitor.
8. *The Supply of Beer*.
9. Slade, M. (2010) *op. cit*.
10. Lawler, K. & Lee, K.-P. (2003) 'Brewing'. In P. Johnson (ed.), *Industries in Europe Competition, Trends and Policy*

Issues. Cheltenham: Edward Elgar Publishing Limited.

11. Horowitz, I. & Horowitz, A.R. (1969) 'Concentration, competition, and mergers in brewing'. In J.F. Weston & S. Peltzman (eds.), *Public Policy Toward Mergers*. Cambridge, MA: Goodyear Publishing Co.; Greer, D.F. (1971) 'Product differentiation and concentration in the brewing industry'. *The Journal of Industrial Economics*. pp.201-219; Greer, D.F. (1981) 'The causes of concentration in the US brewing industry'. *Quarterly Review of Economics and Business*. pp.87-106; and Hawkins, K. & Radcliffe, R. (1971) 'Competition in the brewing Industry'. *Journal of Industrial Economics*. pp.20-41. The latter focuses on the UK industry.

12. Lynk, W.J. (1984) 'Interpreting rising concentration: the case of beer'. *The Journal of Business*. pp.43-55.

13. Caves, R.E. & Porter, M.E. (1977) 'From entry barriers to mobility barriers: conjectural decisions and contrived deterrence to new competition'. *The Quarterly Journal of Economics*. pp.241-262.

14. Trembley, V.J. (1985a) 'A Reappraisal of Interpreting Rising Concentration: The Case of Beer', *Journal of Business*. 58, 4, October, pp.419-431.

15. A recent report by Datamonitor (op. cit.) had segmentation as: Standard lager 40.4%, Premium lager 35.7%, Ales, stouts and bitters 12.8%, Speciality beer 9.1% and Low/no alcohol beer 2.0% showing the survival of certain sub-sectors.

16. Tremblay, V.J., Iwasaki, N. & Tremblay, C.H. (2005) 'The dynamics of industry concentration for U.S. micro and macro brewers'. *Review of Industrial Organization*. pp.307-324.

17. Slade, M. (2004) 'Market power and joint dominance in UK brewing'. *Journal of Industrial Economics*. pp.133-163.

18. For example: Jovanovic, B., & MacDonald, G. (1994). 'The life cycle of a competitive industry'. *Journal of Political Economy*. pp.322-347; and Klepper, S. (1996) 'Entry, exit, growth and innovation over the product life cycle'. *American Economic Review*. pp.562-583.

19. Geroski, P. & Mazzucato, M. (2001) 'Modelling the dynamics of industry populations'. *International Journal of Industrial Organization*. pp.1003-1022; and Howarth, M., Schivardi, F. & Woywode, M. (2001) 'On industry life-cycles: delay, entry, and shakeout in beer brewing'. *International Journal of Industrial Organization*. pp.1023-1052.

20. Chamberlin, E. (1933) *The Theory of Monopolistic Competition*. Cambridge, Mass.: Harvard University Press.

21. Koutsoyiannis, A. (1979) *Modern Microeconomics* (2nd ed.). Hong Kong: Macmillan Publishers Ltd.

22. Kleban, J. & Nickerson, I. (2011) *The U.S. Craft Brew Industry*. *Allied Academies International Conference*.

Orlando: Dreamcatchers Group, LLC.

23. Datamonitor (2010) op. cit.

24. SIBA (2010) *Local Brewing Report 2010*. Burton-on-Trent: Society of Independent Brewers; and SIBA (2011) *Local Beer: Brewing Industry Report*. Burton-upon-Trent: SIBA, Society of Independent Brewers.

25. Brown, P. (2011) *The Cask Report 2011-12*.

26. Carroll, G.R., & Swaminathan, A. (2000) 'Why the microbrewery movement? Organizational dynamics of resource partitioning in the U.S.' *American Journal of Sociology*. pp.715-762.

27. Peterson, R. (1997) *Creating Country Music: Fabricating Authenticity*. Chicago: University of Chicago Press.

28. Scarpa, J. (23-30/11/2009). 'Liquid assets: restaurant owners tap craft beer's profitable power'. *Nation's Restaurant News*. pp.1-26.

29. W. Craig Cooper, Wine Director at Pops For Champagne, Chicago.

30. Brian McKeane, co-owner Rush Street, Culver City, California.

31. Rich Higgins, craft brewer and restaurant beer consultant in San Francisco.

32. Thatchers Beer Blog. (19/02/2011). 'Whats better with food, beer or wine? Only one way to find out ...' Retrieved 26/01/2012 from ThatchersBeerBlog: <http://thatchers-beerblog.wordpress.com/2011/02/19/adnams-beer-vs-forrestate-wine-food-matching-evening/>

33. Zerodegree microbrewery and restaurant, etc.

34. George, L. (2009) 'National television and the market for local products: the case of beer'. *The Journal of Industrial Economics*. pp.85-112.

35. Greer, D.F. (1971) 'Product differentiation and concentration in the brewing industry'. *The Journal of Industrial Economics*. pp.201-219.

36. Horowitz, I. & Horowitz, A.R. (1969) op. cit.

37. Lynk, W.J. (1984) op. cit.

38. Trembley, V.J. (1985a) op.cit.

39. Lynk, W.J. (1985) 'The price and output of beer revisited'. *Journal of Business*. pp.433-437.

40. Scherer, F.M. (1996). *Industry Structure, Strategy, and Public Policy*. New York: HarperCollins.

41. McGahan, A.M. (1991) 'The emergence of the national brewing oligopoly: competition in the American market, 1933-1958'. *Business History Review*. pp.229-284.

42. Baker, J.B., & Bresnahan, T.F. (1985) 'The gains from merger or collusion in product-differentiated industries'. *Journal of Industrial Economics*. pp.427-44.

43. Duffy, M. (1983) 'The demand for alcoholic drink in the

United Kingdom, 1963-78'. *Applied Economics*. pp.125-40.

44. Walsh, B.M. (1982) 'The demand for alcohol in the U.K.: a comment'. *Journal of Industrial Economics*. pp.439-446.

45. Nelson, J.P. (2003) 'Advertising bans, monopoly, and alcohol demand: testing for substitution effects using State Panel Data'. *Review of Industrial Organization*. pp.1-25.

46. Greer, D.F. (1971) op. cit.

47. Horowitz, I. & Horowitz, A.R. (1969) op. cit.

48. SIBA (2009) *Local Brewing Report 2009*. Burton-on-Trent: Society of Independent Brewers.

49. Ling, M., Lawler, K., McBain, N. & Moscardini, A. (1999) 'Economics of advertising: Emerging functions of Internet advertising'. *Netnomics*. pp.127-136.

50. SIBA (2011) op. cit.

51. Clemons, E.K., Gao, G. & Hitt, L. (2006) 'When online reviews meet hyperdifferentiation: a study of the craft beer industry'. *Journal of Management Information Systems*. pp.149-171.

52. Fogarty, J. (2010) 'The demand for beers, wines and spirits: a survey of the literature'. *Journal of Economic Surveys*. pp.428-478.

53. Becker, G. & Murphy, K. (1988) 'A rational theory of addiction'. *Journal of Political Economy*. pp.675-700.

54. Brown, P. (2011) op. cit.

55. Penn, J. (1988) 'An econometric study of the demand for bottled, canned and bulk beer'. *Economic Record*. pp.268-275.

56. Culbertson, W.P. & Bradford, D. (1991) 'The price of beer: some evidence from interstate comparisons'. *International Journal of Industrial Organization*. pp.275-289.

57. Koksalan, M., Erkip, N. & Moskowitz, H. (1999) 'Explaining beer demand: a residual modeling regression approach using statistical process control'. *International Journal of Production Economics*. pp.265-276.

58. Ogwang, T. & Cho, D. (2009) 'Economic determinants of the consumption of alcoholic beverages in Canada: a panel data analysis'. *Empirical Economics*. pp.599-613.

59. Hausman, J., Leonard, G. & Zona, J.D. (1994) 'Competitive analysis with differentiated products'. *Annales d'Economie et de Statistique*. pp.159-180.

60. Abbott, A.J., Lawler, K.A., & Ling, M. (1998) 'An empirical analysis of the effects of the Monopolies and Mergers Commission Beer Orders (1989) on the UK brewing industry'. *Applied Economics*. pp.145-149.

61. Or perhaps former British Colonies would be more appropriate.

62. Hogarty, T.F. & Elzinga, K.G. (1972) 'The demand for beer'. *Review of Economics and Statistics*. pp.195-8.

63. Clements, K.W. & Johnson, L.W. (1983) 'The demand for beer, wine, and spirits: a systemwide analysis'. *Journal of Business*. pp.273-304.

64. McGuinness, T. (1980) 'An econometric analysis of total demand for alcoholic beverages in the UK: 1956-75'. *Journal of Industrial Economics*. pp.85-109.

65. Ornstein, S.I. & Hanssens, D.M. (1985) 'Alcohol control laws and the consumption of distilled spirits and beer'. *Journal of Consumer Research*. pp.200-13.

66. Lynk, W.J. (1984) op. cit.

67. Trembley, V.J. (1985b) 'Strategic Groups and the Demand for Beer', *Journal of Industrial Economics*. 34, 2, December. pp.183-198.

68. Walsh, B.M. (1982) op. cit.

69. McGuinness, T. (1983) 'The demand for beer, spirits and wine in the UK: 1956-1979'. In M. Grant, M. Plant, & A. Williams (eds.), *Economics and Alcohol*. London: Croom Helm.

70. Godfrey, C. (1988) 'Licensing and the demand for alcohol'. *Applied Economics*. pp.1541-1558.

71. Abbott, A.J., Lawler, K.A., & Ling, M. (1998) op. cit.

72. Moosa, I.A., & Baxter, J.L. (2002) 'Modelling the trend and seasonals within an AIDS model of the demand for alcoholic beverages in the United Kingdom'. *Journal of Applied Econometrics*. pp.95-106.

73. McGuinness, T. (1983) op. cit.

74. Duffy, M. (1981) 'The influence of prices, consumer incomes and advertising upon the demand for alcoholic drink in the United Kingdom: an econometric study'. *British Journal on Alcohol and Alcoholism*. pp.200-209.

75. Johnson, J.A. & Oksanen, E.H. (1977) 'Estimation of demand for alcoholic beverages in Canada from pooled time series and cross sections'. *The Review of Economics and Statistics*. pp.113-118.

76. Heien, D. & Pompelli, G. (1989) 'The demand for alcoholic beverages: economic and demographic effects'. *Southern Economic Journal*. pp.759-770.

77. Abbott, A.J., Lawler, K.A., & Ling, M. (1998) op. cit.

78. Gofton, L. (1990) 'On the town: drink and the "New Lawlessness"'. *Youth and Society*. pp.33-9.

79. Coffield, F. & Gofton, L. (1994) *Drugs and Young People*. London: Institute for Public Policy Research.

80. Mintel. (1988) *The On Trade Revolution: The Brewing Industry Response to Change*. Mintel Publications Limited.

81. Measham, F. & Brain, K. (2005) "'Binge" drinking, British alcohol policy and the new culture of intoxication'. *Crime Media Culture: An International Journal*. pp.262-283.

82. Measham & Brain note that the alcohol industry reacted in kind to the normalisation of recreational drug use during

1990s.

83. Hart, O.D. (1985) 'Monopolistic competition in the spirit of Chamberlin: a general model'. *Review of Economic Studies*. pp.529-546.

84. Datamonitor (2010) op. cit.

85. Heflebower, R.B. (1967) 'The theory and effects of nonprice competition'. In R.E. Kuenne (ed.) *Monopolistic Competition Theory: Studies in Impact*. United States of America: John Wiley & Sons, Inc.

86. Carroll, G.R., & Swaminathan, A. (2000) op. cit.

87. Quoted in Van Munching, P. (1997) *Beer Blast: The Inside Stories of the Brewing Industry's Bizarre Battles for Your Money*. New York: Random House. p.247.

88. Howarth, M., Schivardi, F. & Woywode, M. (2001) op.cit.

89. Ireland, N.J. (1987) *Product Differentiation and Non-Price Competition*. Padstow, Cornwall: Unicus Graphics Ltd.

90. Peterson, R. (1997) op. cit.

91. Brown, P. (2011) op. cit.

92. EUCAM. (2008) *Women - The new market: Trends in Alcohol Marketing*. The Netherlands: European Centre for Monitoring Alcohol Marketing.

93. Purity Brewing Co. (16/02/2012) 'Hit FemALE event strikes again'. Retrieved 01/03/2012, from Purity Brewing Co.: <http://www.puritybrewing.com/images/120216%20-%20FemALE%20Strikes%20Again.pdf>

94. BBPA. (08/03/2012) 'Industry united on duty freeze - lobby your MPs, Brigid Simmonds urges SIBA conference'. Retrieved 11/03/2012, from British Beer & Pub Association: http://www.beerandpub.com/newsList_detail.aspx?newsId=487

Appendices

Appendix A: Transcript from Purity Brewing

Brewer 1: (Halsey, 2011)

Sam Floy: What's the general ethos for Purity?

Paul Halsey: It's always trying to be slightly different to the traditional Cask Ale market. So we're six years old in October, we thought there was an opportunity to, in basic terms, funk it all up a bit really, make it slightly cool. A little bit like what happened in the American Craft Ale market, in particular in the North West in Oregon (?) and Seattle is that they've made it more of a lifestyle choice, slightly cool. Historically cask ale in the UK is CAMRA/ traditional pubs,

we said no, we've got to attract 20-30 year old males and we've got to get women into it so we made the branding really cool, we made our beer slightly lighter, slightly chilled and we've got involved in loads of contemporary events: music, food festivals stuff like that, so our approach is very much marketing driven, brand-driven and we've got very good, consistent quality beers that follow that behind.

SF: And has that always been from inception, or have you had to change that at all?

PH: No from inception we started with two beers: Gold and Ubu, and we introduced Mad Goose a few years ago. We are virtually at capacity at the moment so we can't keep introducing new beers because innovation is a key part of that differentiation. So that will come about once the new brewery is built.

SF: Who do you see as your main competition?

PH: I think, the micro-/ craft beer market is the competition, we don't see a lot of competition from within the Midlands, although Wye Valley, 60 miles away are very good at what they do, their approach is very typical; about community spirit, sustainability, all about local sourcing. Yeah that's important, but we're about being cool and the brand and the music, and the arts. In more of a lifestyle choice, a cool choice, people who didn't probably drink cask beer five/seven years ago. National brewers are going to be competition because they've got declining market, declining volumes so they're going to start looking at the micro- market and start introducing beers that are slightly similar to our style. I don't think they can do it, I think they're too big. It's like the Titanic, it can't move quickly can it. Whereas we can duck and dive, we can be very reactive. So yeah, new and up-and-coming microbreweries are going to be our competition.

SF: And so when you're planning campaigns, you're not directly thinking about what people like Carlsberg/ Heineken are doing. Are you focussing more on your market?

PH: We certainly look at the wider market, and what they do, we look very closely to that side of the market, get all the publications sent through. I'm out with the consumers on a regular basis. It's interesting what they do, but because of their size and how big they are ... we're into independent thinking, free-thinking kind of person - they're almost anti-big brand, this urbanisation thing is all about it's cool and it's ... 'I like Purity because they're not force-feeding me to drink their beer, but it's a great brand'. So they're very brand conscious but they're fiercely independent on what brands they want to be part of. It's a bit like the music world, do you

like Hip-Hop/ mainstream/ Indie, you follow that brand. It's a little bit like that really.

SF: Have you found through talking to consumers that you've seen people actively moving away from say, having a Carlsberg, to having an Ubu?

PH: Yeah, I think there are certain drinkers that always going to consume a brand, they're going to have a major brand. Carling spends how many millions of pounds on advertising a year, they are always going to drink Carling. That's not the kind of consumer that we're after, we're after the more discerning consumer that wants to spend good money on a really refreshing and interesting kind of premium beer. So we're trying to trap possibly the wine drinker or the premium packaged lager drinker, the more discerning drinker. We have got hold of the mainstream drinker and we've introduced them to it and they like it, but there's a big slice of it that we're never going to get. I was thinking of a small percentage, and it's a big percentage of that small percentage, that it's a big enough number that we'll bring them over. It's getting people away from your premium packaged and wines and getting them into beer in a different environment, so you start to see cask beer in style bars, in boutique hotels which you never saw six or seven years ago.

SF: And what's been the main drive towards that change, has that been consumer driven or is that you going to these boutique hotels and saying - 'I think you should stock this for these reasons'?

PH: I think it's both. The consumer's got fed up with bland, the next generation of drinkers, the 20-30 year olds coming through want to drink the opposite of what their father drank which was a lager/ Stella drinker and almost like they're kicking back against that. And I think that the younger people, women as well, are a lot more informed and they want flavour, they want provenance, they want to understand about the brand, they want to buy into it, they're not just fooled by advertising anymore, they really want the details. And someone who can tick a load of boxes, saying that it's sustainable, it's great quality, actually we're quite cool, we care about our community. That makes a difference to people.

SF: And so is that how you've seen yourself differentiating, this is the brand, your competitors aren't focussing as much on their brand? Or are there similar brewers who are again going for your angle as well, sort of trying to be ...

PH: I think some of the specialist companies have gone down the route of innovation, it's about bringing new beers to the market all the time. Rather than brand building, but they've

really been innovative with some of their beers, and the brand's come about by default really. We've really focused on establishing a brand, Purity as a brand, and our three beers and focussing on those three beers to establish permanency with those brands and like the question before, have we driven the brand or has the consumer, and it's a bit of both, the consumer has wanted change and wanted things different, the general tastes are bland and don't want that anymore, and we've driven that we've positioned the brand with boutiques hotels, premium bars, we've done a lot of food and drink matching in Michelin Star restaurants and people have thought, I go and have a meal and not have to buy a really expensive bottle of wine, actually you can have a fantastic bottle of beer with this, that really does complement that course so we've done a lot of work with beer and women, we've done events in Birmingham solely for women, and again matching food and drink. So we've driven that as well, I think the consumer has just been ready for that change.

SF: How much are you committing to your marketing, brand awareness and these events you were saying about, putting on the beer and food events, how much as a percentage/ as a lump sum are you ...

PH: I would say 75% - we just took on a new marketing PR manager, to kind of drive this. So 75% of our marketing brand is about positioning the brand in that area, so we'll update our website - make it more innovative and challenging, more interactive, we're going to carry on supporting the music/ the arts/ the food/ the restaurants. Most breweries have been set up by ex-brewers or hobbyists who don't really understand the brand, they're either brewers or they come from an engineering background, we've come very much from a marketing background.

SF: Out of interest what is your background?

PH: Sales and Marketing at Bass Brewers, Sales Director at big regional brewers and ran pubs and restaurants from inception to finish. I understand not just brands and marketing/ routes to market, I understand the consumer and being a retailer as well.

SF: What is your interaction with organisations like SIBA/ CAMRA/ BBPA?

PH: BBPA not so much. SIBA have really evolved over the past five years as a group, an industry group and a voice for the industry, for the brewers. I've been very active in that, was a non-executive trustee for them as well for three years - the representative from the Midlands. They also enable route to market as well (Direct Delivery Service), enables us to

access the likes of Enterprise Inns and Punch Taverns through DDS, but you can read about that on the internet..

CAMRA: consumer group. Big break for cask beer over the years, I think they've had their day in my opinion, but we work with them.

SF: SIBA on the supply side, CAMRA on the demand side..

PH: SIBA is a trade organisation/ trade body and represents brewers, small brewers and CAMRA is the consumer group.

SF: The evolution of small brewers coming back to the fore-front, why is it that smaller brewers are seeing a resurgence

PH: It all started with the MMC Report in the eighties that broke the tie up and enabled the Guest Ale into big pubs owned groups owned by brewers so you have the mergers which lead to the formation of the big pub groups such as Enterprise or Punch Taverns are formed, breweries got sold off. The focus of the big companies such as Bass and Allied came away from cask beer, they said 'that's dead, it's all about lager, lager's the future' - so they took their eye of cask beer and some of the smaller, regional brewers got formed and in the last ten years, progressive beer duty came about which really encouraged anybody brewing <60 brewers barrels a week got a 50% reduction on their duty rate, so that encouraged innovation and new brewers to come to the market and I think the upsurge has come about through differentiation/ innovation and consumers change - they want flavour, they want choice, they want local, they want to support the local community and if there's a brewer down the road brewing great local beer, they really buy into it. In Birmingham there was Mitchells & Butlers brewing their beer, Bass in Burton, Davenports in Birmingham, Amstells in ... those guys are gone, so no-one had a local brewery anymore. Now there's 800 brewers in the UK again, and localism has really come about. Quality and consistency is key to it. If quality consistency is not right then it's not going to work, like I said, we are competing with the Big Boys, we can't in terms of our market, expand but in terms of consistently quality, we're more innovative, we relate more to the local community. They can come and see us, we're part of the community.

SF: And so do you see in that sense, you're always going to be somewhat constrained in that if a lot of your strategy is connecting to the local community, if you're then pitching it, trying to sell your beer to someone who lives 200 miles away, then they're not necessarily going to have that ...

PH: I would say that if used say, the Alcester Brewing Company that wouldn't mean anything to anyone probably

outside of Warwickshire, but because the name is Purity and the name is very much developed on integrity, natural ingredients, quality - that's why we used it. But Purity can be sold throughout the UK, can be sold throughout Europe so we don't feel we're kind of like, shackled in any way, we know our beer will sell really well in London we know our beer will sell well in the North of England, a lot of smaller micros are very much, very local and because they are using a name like Warwickshire Brewing Company or Wye Valley there is a limit to how far that beer can go before it doesn't really sink in with that local community. We believe that the Purity brand doesn't have those shackles around it. Although we're very strong in the West Midlands, that's our heartland.

SF: I've seen that you've expanded all over the place, I've had Ubu quite a lot and then I was down in London in the summer and just saw it there, just in a pub and was like 'I wasn't expecting that'. How have you gone about distribution? Do your guys drive down to London each time or ...

PH: Route to market is really key to the brand's success, we've decided not to use wholesalers just because wholesalers, we believe, damage your brand, they don't really care for your beer and if there's another beer that comes out that is better or cheaper and they can make more margin then they'll replace it, so it's been very much - 70 mile radius and we'll deliver direct, in London we've chosen a few partners to work with, and London's been very much part of our strategy and more so going forward so in London we've got Adnams representing us and we've got a company called Euroboozer that we give them exclusivity, outside Adnams, for the London area. So we've probably got about 13 permanent stockists in London.

SF: And so is there a plan then to find more of these partnerships as it were?

PH: Yeah we want to develop the London partnership and make it bigger and better, so we're looking to quadruple what we send to London. We've found, we believe, a partner in Bristol for the South West. Midlands, we can grow further throughout our own direct delivery and we're going to look for a partner up in the North of England who can do Leeds, Manchester, Sheffield and York. But not wholesalers.

SF: Where do you see Purity going in the next ten years, do you think that there's going to be other brewers that are going to try a similar business model to yours and will that be a problem for you going forward?

PH: Well business is business, it will be very much about us

innovating and continuing differentiating ourselves in terms of what we do; if you stand still you'll lose your market share so we need to grow the business as I said to you before, London is really key so we're looking at how we're developing there, we're going to get two more sales people into the team to develop our sales and we're going to be looking at doing an unfiltered, unpasteurised keg version of one of our beers and we're going to be bring two more beers to the market once the new brewery is built so it's continually evolving, continually looking at bringing new beers to the market and through working on the brand and the digital side of our business and making sure that we're still cool out there and we believe we can treble our business from 10,000 barrels that we currently do to 30,000 so ... hopefully in 5-7 years' time, that's what we'll be doing.

SF: Just quickly, how have you come up with trebling your output?

PH: At the moment we're at capacity in our current brewery, we're selling the beer that we brew and we can't brew much more. We're putting a new sales team in place, two new people for the Midlands, we're going to develop in London and even further so that we can quadruple volume there, and then we're going to set a partner up in the North of England. And there are a couple of Pub Companies that want to trade with us, and we're looking at doing that. Doing a new keg version of one of our beers will open up a new market to us.

Appendix B: Transcript from Durham Brewery

Brewer 2: (Gibbs, 2011)

Sam Floy: So, what is the general ethos in your business to ensure that you thrive?

Steve Gibbs: Well, depends what you mean by general. Erm, there is a tendency for microbrewers to want to get bigger, it's this thing with business, business has to get bigger to make more money to get more products through, erm, that OK that's not really craft - that's big business, that's aping the big breweries and a lot of small breweries now are getting bigger and bigger and bigger and they're selling more and more volume, for cheaper and cheaper and cheaper, and there are so many breweries now. When we started, there were two hundred, two hundred in the country (including the big ones), now there's more like eight hundred, so the competition has increased exponentially, the market itself hasn't really grown, the number of pubs is diminishing all the time, it is changing but it's ... One side is for volume.

The other side of the ethos is proper craft and making beers

that are different. What we'd like to do, we've always ... we started off as cask only. Ten years ago we started doing bottles, now we're doing more and more different bottles, we're finding - especially from America which is extremely innovative - we're getting all kinds of new beer styles through, they experiment like mad. Well it's starting to filter through to England, especially with people like Brewdog, they've copied the American ... There's this thing about IPA. IPA is Indian Pale Ale, but the Americans have taken it right on board and changed it, and they've come up with very bitter beers, with hop aromas, from their own hops, that are really aromatic, but very bitter. So bitter that it's astringent, this is what Brewdog have done. But there's lots of new things coming through so we're actually starting to do a lot more in that vein. We're doing lagers. We do wheat beers and all sorts of things, but to survive we're not going down the volume route, we're going down the niche route. Because we're going to stay small, we're not going to get big, that's our ethos. So there's two different types of playing the game. The North East is a bit slow I'm afraid, erm but there is a contingent within Newcastle which is going for the new stuff.

SF: And so when you say that you started doing Wheat Beers and started to do lagers, is that a case of ... how do you then about ... do you do it from scratch? If you've never done a lager before how do you then go and make your own lager?

SG: Well we've been doing this for years actually. I've been experimenting with these beers for years but they've just becoming popular now, so I think that I was before the market, ahead of my time in a way, but all you do is ... the difference is you find out how, OK, a lager, a proper lager is, erm is made with a bottom fermenting yeast, it's made under low temperatures and lager means that it's stored, it's kept, forget about Stella because that's not lager. But just read books and find out, and taste stuff, get the right yeast, give it the right conditions and make it. Simple.

SF: OK, you sort of eluded to it then, so you see your main competition, is it mainly these other microbreweries or do you at all consider what Stella, Carlsberg are ...

SG: Nah, we've never considered the large brewers to be our competition. It's the small brewers. Erm and it hasn't been too bad up until the last two or three years, but there's been an explosion in the number of microbrewers, and the market's still quite small, but only so many pubs in the area that can have our beer. I mean, you've just told me that you can't, well there's only so many that can have our beer, but with more and more breweries, OK we're not actually out to kill each other. But if there are more breweries and somebody else is

on the bar - we're not. It's just simple logic isn't it. Erm and there are more coming up all of the time. There are more starting all of the time. For years I've been saying, look there's got to be a limit, the bubble's going to burst, so look, if you're going to make it, you're going to make it so difficult to sell beer because there are too many of us and you're another extra one, you're going into this market and you're going to make it even more difficult, even for yourself. They still keep piling in, cos everybody's heard that it's a growth industry. The trouble is, beer volumes overall are reducing in mature markets, the growth is China, India, I don't know about Japan but definitely in the Emerging Economies, there's growth in Beer, because they've never had it, they've never really had it. But it in the mature economies like ours and America, the beer volumes are actually going down. I think just this morning I was reading an article about 1.2% down last year, that was the total beer market, but Craft breweries are increasing whereas a few years ago they were 1% of the market and now they're more like 4-5% of the market. But microbrewing is increasing into a falling market. I don't know whether we'll actually break the mould and keep increasing but if the market's going down, when are we going to hit the point when microbrewing - the bubble breaks and microbrewers just can't go any further - We just don't know. Unless, we're creating a brand new market, forget the old beer market with the Big Brewers, we're not competing with them, we're making something new and something different. People used to go down a pub and have a pint of bitter or a pint of mild, or mix them and have mild and bitter, and your brewery was your local brewery. And that's what they drank, all of the time. The local people - Spennymoor they don't like our Magus, the best selling pale beer, I think because it's got flavour. They like John Smiths and those sorts of things. They will not move onto something new. It's that mass market which is actually dying a death. But our market is something new. People come in here, they want something to drink at home, they're not going to the pub so much. They drink at home and if they've got some money to spend, they don't want to drink some ordinary beer, they'll drink ours. So really, maybe we're creating a brand new market and maybe that will keep increasing. Who knows, but there's going to be a deciding point soon, because there are too many.

SF: So what do you think is the main reason why it's gone from 200 to 800? Is there any particular, specific reasons why you think ...

SG: Yeah, well CAMRA and SIBA. We're in SIBA, I was in SIBA when it was just a handful of people, we started seventeen years ago and we got into SIBA straight away, it was

only a few people in it. And SIBA campaigned for progressive Beer Duty which means that we were paying the same beer duty as the large brewer. And the government brought in this progressive beer duty. If you're under 5,000 hectolitres a year, that's your production, you're on half beer duty, and then you go on a sliding scale up to what everybody else pays. This reduction in Beer Duty made it much cheaper for us to make beer, because we're not saddled with all of the costs and the tax. That was a big incentive for brewers to start up. On top of that, CAMRA and SIBA have been saying for years: 'Look it's fantastic, there's lots of breweries starting up, this industry's doing so well', so everybody thinks ... Of course there's this other thing as well which is that people think to have a brewery is just a wonderful thing. Because of these reasons, people have piled in. Before progressive Beer Duty we were profitable. A lot of people were really struggling and the idea was that you'd spend the money on your business, or you could reduce your prices to get into the Big Brewers. The Big Accounts. So you get into Pub Companies, this sort of thing. So your beer is cheaper. But because you haven't got Economies of Scale, our beer was far too expensive to make. Therefore, we couldn't expand into the big markets. So you've got progressive beer duty, that allows you to get in, because you can do it cheaper. And what has happened is what I thought would happen, market forces took over, the price of beer has been coming down for years, not at the Bar, it's been coming down for breweries and wholesale, so that's encouraged people to get in, more breweries think that this is a fantastic market, plus of course everybody's saying 'it's a growing market', well it is still, and that has given people an incentive, plus this halo effect - this "Have a Microbrewery - fantastic", eventually reality will hit, and eventually the bubble's got to burst, it's got to. I can't see it keeping going, unless people find different ways of selling beer I just don't know. I don't think the market can take much more.

SF: You mentioned earlier that the cost of brewing has gone down, despite ...

SG: That's the tax

SF: Have your input prices gone down at all ...

SG: They've gone up massively. A couple of years or so ago, there was bad weather which means malt prices went up, one year there was a very bad year for hops. Hops went up massively in price, they've come down since, but what's happened is that the duty is really the big thing. What's happened is, we've got lower duty and we can sell beer cheap to the pub, now the pubs have not responded to that by reducing

the price to the customer. Apart from, say, Wetherspoons - who use the "supermarket principle", he's used that himself. Actually it's biting him [Tim Martin] now because he's complaining about the market.

The lower prices are giving greater profit to the pubs.

Whereas the pubs used to, we used to sell and they'd say that they wanted about 50% Gross Profit Margin, now they're wanting more like 70%. They're taking more profit from us, they're still keeping the price up with the customer, but in a way I can't blame them because they're not getting as much volume through the pub. So they've got to make more profit per item to be viable. Because people aren't drinking in pubs like they used to. There are other influences here as well, why don't people go to pubs like they used to? Well, the government, we started recession and what the government does? It brings in 'no smoking in pubs'. So the pubs emptied overnight. There are some pubs which just died overnight because there's no smoking. A lot of those drinkers who went every night were smokers. So they drink at home. It's one of the biggest industries in the country and the government is wrecking it. OK, Drink Drive. You shouldn't drink and drive, but all of these laws are conspiring against pubs. So what we've done is, this is the way we're competing is - you're in our retail unit. We've got a Bar here, we've got a full On-Licence. We've also got lots of bottles and we're exporting as well. So we're responding in different ways, we're still going to the pubs, but the bottles now are probably a third of turnover.

SF: And this has grown from nothing 10 years ago, has it been a steady increase?

SG: Oh it's steady, it's going and going. Yeah and we're getting named internationally as well.

SF: So where are you exporting to?

SG: We've got a customer in Austria, we've got a couple of customers in Canada, I think probably in Italy and do you know we had a man in here last week on a Brewery Tour. And that's another thing we're doing, brewery tours - getting people interested, locally. He came from Virginia and our Temptation, a Russian Stout 10%, he says this is a sought after beer in Virginia. I didn't even know. So somebody's wholesaled it to Virginia. We've been in Australia, New Zealand. We've been all over the world. It's only small as we can't do much. But this is the way that we're responding to the current market. We've rebranded, got new 5l mini-casks for home consumption. I've got new products all of the time. All sorts of new things. We are niche and we like to be special, that's how we've coped with it. But the pubs really,

they're not doing as well as they were.

SF: So what percentage of your beer goes to pubs?

SG: It's just bottles and pubs, so 65-70%.

SF: These are mainly local pubs, is that more for transport? Or do you go quite far afield?

SG: We were a cult brewery in West Yorkshire. 10 odd years ago. We were big. We've been in Manchester area, Nottingham, Derby. We're finding now that we're going less and less further afield. Because there are so many breweries locally and they're having their local beers. If we're going to go, say 150 miles or so, you've got to fill a van up and unless you really are wholesaling and you're going a long, long way, you've got to have a van load and it's got to deliver that load in one day and come back home. So you're limited by that. Now if you can't fill a van up, you either go less often so you do get a van full, or you don't even go at all. But it's reduced the amount of journeys we've got to Sheffield or wherever because of the competition with so many microbreweries and the price coming down, it's not viable with fuel costs going up. So we're squeezed the whole time, so we're looking at different ways to sell beer. But that's what the market is doing. Too many breweries. And the pubs, people aren't going out the same.

SF: And so, the name - 'The Durham Brewery' - that's obviously striking a chord with people here. When you started up, did that mean that at inception you always had the idea of keeping local. You've got these dots all over the world, but it was never like you were going to make a beer that was drunk all across the country?

SG: We'd prefer to be local. But it's cheaper for us as a start - we didn't spend as much money on vans, on fuel and everything else. We're getting more and more local, especially in Newcastle. We made a beer very early on called Magus, it's really very popular, some pubs have it on the whole time. It would be good to be more and more local and sell more of the bottles locally. There's people coming in all of the time. We had somebody last weekend, he says he comes up here really to just get the beer. He's come 70 miles, just to stock up on our beer and I says 'it would be cheaper for you buy it online and just get it delivered because it's only £8.50' rather than coming up here in a car and then going home in a car all that way. He says he likes coming though. So that part of the business is increasing all of the time.

SF: So going back to the name, are finding that these companies in Virginia and Austria are enjoying the beer for its

taste, but is the Durham brand, the fact that Durham is this old, North Eastern English city, is that striking a chord with international companies, or is it purely on the taste do you think?

SG: I haven't a clue. We've got this customer in Austria, he really does go for our beers and he gets a couple of pallets a year, just for his own restaurant. And he has a Beer Festival every two years. We took a Bar with hand pumps, now they don't have hand pumps across there - it's all keg - so that was new for them. But we'd got a big banner up saying: Durham Brewery from the North East and people were asking us - is that in Scotland? Because people in Austria haven't heard of Durham, not even Newcastle, but they've heard of Scotland. When they come on holiday to Britain, they go to Scotland because there's something over there that says 'Scotland is the place to be'. Don't ask me why. So I really don't know if The Durham Brewery means anything to anybody out of the country. If they do like our beer it's because of the flavour. One thing that I think has made a big difference is that we've got awards. This year we've got an award from the International Beer Challenge. Also, the British Bottlers Institute. Now I think that wholesalers look at the results of these awards and then source the beers because if it's going to win an award, it must be alright. So I think these foreign people and whoever will look at these awards and think 'we'd better try that'. Maybe that's how we're getting in.

SF: So what is your relationship with wholesalers, do you have a number of local wholesalers?

SG: Oh they can be all over the place.

SF: But you actively look to ...

SG: We don't actually, we're not very aggressive - they come to us. But the beer reputation is travelling far and wide. Doesn't matter the bloke across the road doesn't know we exist, but they know we exist in Virginia. Fellow in Bowburn doesn't know, the North East is a strange ...

SF: Were you affected by the Tied Estates?

SG: Look at the students, we can't get in. We are affected. There's a massive market there - can't get in. Well bits and bobs here and there. We did a Hild Bede ale, Special Label. But it's not very often that we get something from the students. So yes, we are affected. SIBA started a direct delivery scheme, where SIBA negotiated prices with Punch, Enterprise some of the big people. We can deliver to those pubs direct, but only on a special price grid so yes we can get in on those because of that. But going direct is much more difficult, they just want it too cheap. Lots of small breweries are in

Wetherspoons, there's no profit. They just want it so cheap that there's no profit. And for us, no point. If it's not going to make profit then there's no point. So the big stuff is still a bit out of range as they still want ... it doesn't matter how cheap you sell it, they going to want it a bit cheaper. And another brewery down the road will do it that bit cheaper. They might not be making any profit, but they'll still do it. This is a market economy. And this is why I'm saying that there are too many breweries.

SF: You mentioned with SIBA, they helped you out Direct Delivery, how else do CAMRA and other institutions help you out. Do they help you with marketing or anything like that?

SG: Well CAMRA's a do-do (shouldn't say that). CAMRA's not going to help anybody. We help CAMRA. We sponsor the local beer festival. Costs us £1000 this year. But it does get us a good range of beers in. Good exposure, good advertising. But we're actually helping them. CAMRA did a good thing, they got the whole Cask Beer thing restarted, and all these microbreweries are really because of CAMRA and SIBA of course is helping us to get to market, but when it comes to marketing it's us. You mentioned the name, The Durham Brewery well when we started we thought, what are we going to call it? And I thought what's the best name that makes us look big? The Durham Brewery. So we got it and our bottled beers especially have got ecclesiastical names, so we've locked into local Christianity, the Celtic Christianity and the Cathedral. Then there's St Cuthbert of course, you've got Celtic knotwork. So that's our idea and the marketing is all us. If we win an award, we have to tell people. Nobody else does it for us. It's just a tool that we can then use which is all down to us. We've just had a brand new website made, which is marketing again. It looks good, gives people confidence that we know what we're doing. But it costs us.

SF: So how much on a typical year over the past five years, how much would you spend on advertising, say a percentage of Total Cost? Or is that ...

SG: On a normal year, very little. People ring us up all the time, newspapers, the advertisers but we find that type of advertising doesn't do us any good because if people know about us they come anyway and it's something with the human brain, it works in categories, it sees what it knows, it likes what it knows and an advert for something that they don't know about doesn't get seen. It's almost transparent. And those little adverts don't do any good at all so we do for some years we've been doing one in the *Advertiser* which is

a whole page. One page pull out on the Christmas Edition, that's cost us £500. Then there'll be CAMRA, we've spent £1000 on, so I don't know. We'll probably do £2-3000 out of a turnover of £400,000, it's peanuts. This year we've spent a heck of a lot. This year we've gone into loss last month because we've been spending so much. Spent £10,000 on doing new bottle labels and a new website. On top of that, new tanks, all sorts. We can see things dying this year with the recession, we're really pushing hard to keep the impetus up. So this year we've spent a lot, but normally hardly any. Don't need to because we can do all of our own posters, we do our own bottle labels, the website is a fantastic tool now. I've got over 900 people on an e-mail newsletter. Using a lot of Twitter, got Facebook, but that doesn't work the same. We're pushing in those ways. We're pushing to the people that appreciate us. To move somebody from drinking John Smiths Smooth to drinking this, which is what we need to do, is almost impossible. But even then, we go to markets. Sedgefield - a waste of time. It's known for its car boot sales, we went there and were lucky if we broke even. There last weekend, passers-by looking for a discount. And yet, I was in York a couple of weeks ago, and there's a fantastic shop there with all sorts of beer from all over the world, stuff in champagne bottles, from microbreweries. Or in Manchester. And they're selling it for a damn good price. But the people who like it, like it. There is a market there, but it's a small one and it's ... I was reading this morning about the American market; the people who like this sort of beer are affluent and don't mind spending a bit extra. But for the general market, the John Smiths Smooth drinkers they're not interested and will just drink something tasteless and cheap. But we're in a special niche market, but we're competing now because there are a lot of up and coming breweries that are just starting to do the same thing.

SF: And so do you feel like you've got a First Mover Advantage over these breweries ...

SG: Oh yeah.

SF: So you can sort of be quite nimble so if you see other brewers starting to do things you can come over and almost use the Durham Brewery brand to quash what they're doing?

SG: Well we started seventeen years ago and we've got the reputation. Whereas someone starting today has no reputation, he's going to find it hard. So he's got to do something blasto, something really good to grab the market, we've got a good established name. Yeah, it does help. And because of that we've got revenue, we've got proper customer base so this year we've sort of turned it around more to the retail, more to

the special ... So we've changed.

We moved away from the big logo with a bit of text to a newer version. The old label is more associated with quality, seen like a wine bottle label.

SG: They do say that when a brewery gets big, the quality changes. And it does. I think one of the reasons that the really large brewers make bland beer is because they do large volume and it's the beer which has to be offensive to nobody. It's got to be universally acceptable whereas we've got lots of different beers and some people might hate one but they like another one but, if they're going to hate something about that one it means if you're going to do lots of volume, you've really got to have a smaller range of beers to cope with it. So you've got to have everybody liking it. And that's why it's bland.

Appendix C: Questionnaire and responses

Response 1

General

Name of Brewery:

Address:

Established:

Contact Details:

Financial

Annual turnover: £1.1 million

Total annual sales (volume): 4,500bbl

Staff employed: 10

Investment Profile (%): {percentage of what and over what time period?}

- Fixed capital [brewing equipment etc.]

- Staff

- Branding

Production

Annual Total Cost of production of beer: Direct costs total £650,000 (including distribution costs £15,000 and cellar services costs of £13,000)

Breakdown of cost structure (%): As percentage of turnover

- Production - we achieve a 42% gross margin on production as noted above.

- Administration {what to include in this?}

- Advertising (including general marketing, POS etc) 3.4%

How would Total Costs be affected if production increased 50%: Fall

How would Total Costs be affected if production decreased 25%: Same

How can you lower your Unit Cost of production, and what steps are you taking to do so: Increased investment in equipment to make process more efficient, training of operatives

How many different brews do you produce: 3 at any time during the year - 2 full time and one rotating seasonal of which total number produced to date is 3

Qualitative Questions

What is your general ethos to ensure that you thrive as a business? Quality, Quality and Quality

Who do you see as your main competition? Regional brewers

How do you differentiate against your competitors? Locality, provenance, customer service

There has been a resurgence in smaller brewers in the last few years, what is your view on this? Very good for the industry, promoting locally sourced products and the local supply chain therein, raising awareness in consumers about home grown(brewed!) products, developing a potential to export especially with Olympics and Jubilee approaching.

Response 2

General

Financial

Annual turnover: £50k

Total annual sales (volume): 300 HI's

Staff employed: 0

Investment Profile (%): N/A

- Fixed capital [brewing equipment etc.]

- Staff

- Branding

Production

Annual Total Cost of production of beer:£40k

Breakdown of cost structure (%):

- Production 90%

- Administration 8%

- Advertising 2%

How would Total Costs be affected if production increased 50%: Production costs would rise by 25%

How would Total Costs be affected if production decreased 25%: Costs reduced by ingredients not used

How can you lower your Unit Cost of production, and what

steps are you taking to do so: Brew more in order that overheads covered by more brews

How many different brews do you produce: 6 (incl 2 seasonal)

Qualitative Questions

What is your general ethos to ensure that you thrive as a business? Ensure the quality is good

Who do you see as your main competition? Competition not the major issue, lack of investment of time and money is

How do you differentiate against your competitors? Local orientation, such as beers named after old Wiltshire dialect

There has been a resurgence in smaller brewers in the last few years, what is your view on this? Its positive

Response 3

General

Financial

Annual turnover: £300k

Total annual sales (volume):

Staff employed: 5

Investment Profile (%):

- Fixed capital [brewing equipment etc.]

- Staff

- Branding

Production

Annual Total Cost of production of beer:

Breakdown of cost structure (%):

- Production 40% Excise 40%

- Administration 15%

- Advertising 5%

How would Total Costs be affected if production increased 50%: Excise & materials increase 50%, labour 25%

How would Total Costs be affected if production decreased 25%: Excise & materials down 25%, labour 10%

How can you lower your Unit Cost of production, and what steps are you taking to do so: Increase sales - other costs already reviewed & cut

How many different brews do you produce: 8 regular, monthly specials

Qualitative Questions

What is your general ethos to ensure that you thrive as a business? Cash flow & sales are prime focus

Who do you see as your main competition? Sheer number of small breweries

How do you differentiate against your competitors? Quality of our beers

There has been a resurgence in smaller brewers in the last few years, what is your view on this? Market is too crowded, given the number of pubs closing

Further Comment

If you have anything more that you would like contribute, please do so below:

The recession and cheap booze from supermarkets is hitting our pub customers hard, with more & more pubs closing. The situation is made worse by the big pubcos (Enterprise & Punch etc) not permitting their tenants & managers to buy direct from breweries but instead tying their houses to buy only from the pubco. Effectively there are only a fraction of pubs we can sell to.

Response 4

General

Financial

Annual turnover: £140,000

Total annual sales (volume): 600+ barrels

Staff employed: 2

Investment Profile (%):

- Fixed capital [brewing equipment etc.] 60%
- Staff 10%
- Branding 30%

Production

Annual Total Cost of production of beer:

Breakdown of cost structure (%):

- Production 52%
- Administration 24%
- Advertising 3%

How would Total Costs be affected if production increased 50%: Production costs would increase by 30%, other costs

would only go up about 15%

How would Total Costs be affected if production decreased 25%: Production costs would decrease, but very little saving elsewhere

How can you lower your Unit Cost of production, and what steps are you taking to do so: Wouldn't want to, quality ingredients & no short cuts is where craft brewers score

How many different brews do you produce: 6 regulars + others through the year

Qualitative Questions

What is your general ethos to ensure that you thrive as a business? To do something that we enjoy

Who do you see as your main competition? Other brewers, small and regional

How do you differentiate against your competitors? Local products & good service,

There has been a resurgence in smaller brewers in the last few years, what is your view on this? Debatable as to whether it is sustainable, but need new entrants to keep the industry moving forward and innovating

Further Comment

If you have anything more that you would like contribute, please do so below:

Response 5

General

Financial

Annual turnover: £50 M

Total annual sales (volume):

Staff employed: 140

Investment Profile (%):

- Fixed capital [brewing equipment etc.]?
- Staff?
- Branding ?

Production

Annual Total Cost of production of beer: Overheads over £2 M

Breakdown of cost structure (%):

- Production inc warehousing and transport overheads only 54%

- Administration -29%

- Advertising - Marketing 5.4%

How would Total Costs be affected if production increased 50%: Fixed costs will stay the same as we have enough capacity to absorb this. Variables such as energy will go down.

How would Total Costs be affected if production decreased 25%: Fixed costs will stay the same as we have to operate with this amount of people.

How can you lower your Unit Cost of production, and what steps are you taking to do so: Reduction in labour - energy efficiencies

How many different brews do you produce: 37 over 50 brls

Qualitative Questions

What is your general ethos to ensure that you thrive as a business? Growth and cost savings

Who do you see as your main competition? All breweries

How do you differentiate against your competitors? ?

There has been a resurgence in smaller brewers in the last few years, what is your view on this? They have an unfair advantage in duty which gives them a £55/brl gain through PBD. Breweries of this scale do not get that much advantage. I personally agree that the PBD is a good thing - but some retailers have used this to get unfair discounts from small brewers. Too many brewers at a small level which effect competition particularly amongst themselves rather than the medium size brewers.

Appendix 4: Data Analysis

3.2 Functional form

Discussion starts with the model chosen for the regression. From researching the existing literature a number of studies were considered that aimed to model the Long Run demand for beer – these are discussed in [ch. 2.4].

In terms of specification, a double-log model was chosen, in keeping with studies by (Lee & Tremblay, 1992), (Adrian & Ferguson, 1987), (Clements, Yang, & Zheng, 1997) and (Abbott, Lawler, & Ling, 1998). This technique has certain pitfalls, alluded to in the meta-analysis undertaken by (Fogarty, 2010), that include a potential overestimation of elasticities. Nevertheless, (Alston, Chalfant, & Piggott, 2002) describe

reasons behind the popularity of the double-log model, including its simplicity and ease of interpretation. Continuing from this, the following regression, based on (Abbott, Lawler, & Ling, 1998) is adopted:

$$Q = f(Y, Pb, Ps)$$

Where:

Q : total number of barrels consumed per quarter

Y : real disposable income

Pb : price of beer relative to all other goods

Ps : price of substitute alcoholic products

3.3 Discussion of data

The focus of this study was solely the UK market. A benefit of this was that the UK possesses a number of trustworthy and reputable sources of statistical information. Had this been a cross-country study, data in different formats would have to be adopted, potentially contaminating the final form that it took.

An important consideration has been the period of study with which this analysis was undertaken, with much being dictated by data availability. The HMRC provided figures from their ‘Beer and Cider - Historic Clearances and Revenue’ report to use for Q . This begins with 1994Q1, conveniently the last quarter used by (Abbott, Lawler, & Ling, 1998) and ends with 2011Q3. With this period as a marker, the ONS were able to supply the remaining data from their ‘Quarterly National Accounts Q3 2011’ (Y) and ‘Consumer Trends Dataset – Q3 2011’ for (Pb) and (Ps). The latter had the advantage of presenting the price levels as part of an RPI Index, implicitly giving them relative to the price of all other goods.

As alluded to there were relatively few issues that presented themselves from the data sources. One minor transformation was made nonetheless: converting the data from hectolitres into barrels. This was to align it with the bulk of existing literature, allowing for more worthwhile comparison.

All variables were then converted into log-form to begin a regression.

3.4 Nonstationarity

When considering time series data such as this regression, one of the key issues that needs to be tested for is stationarity, or rather its absence. Indeed, in his introduction to concepts of stationarity in time series, (Maddala, 2001) admits that “most of the time series we encounter are nonstationary”

As background, an informal definition of stationarity is when a variable has a mean and variance that remain constant and are independent of time (Harris, 1995). When this is violated, one of the consequences is a spurious regression and that the results can't be trusted. In addition there could be contemporaneous correlations between the variables, rather than causal relationships, again negating correct inference.

3.4.1 Cointegration

However, despite this it is still possible to use nonstationary variables in data analysis. In their seminal paper, (Engle & Granger, 1987) contend that if variables are cointegrating it is possible that a spurious regression may not occur. The intuition behind this is that cointegration between variables allows them to act as if they were in long term equilibrium i.e. the difference between them is stationary. Consequently, despite possessing stochastic, nonstationary trends, they can be modelled to act in a way not stochastically different from stationarity.

It would prove beneficial to explain some notation regarding the order of integration and its relationship with stationarity. A variable that is integrated to the d th degree is denoted as $I(d)$. With no order of integration, $I(0)$, the variable is said to be stationary whereas at $I(1)$ it is non-stationary. At $I(1)$, if a cointegrating relationship exists then the relationship can be considered not significantly different from stationary. Higher orders of integration complicate matters, however within the present analysis this issue did not arise and so explanation would be superfluous.

For further clarification, (Challis & Kitney, 1991) explain that nonstationary variables possess a stochastic trend and that they contain a unit root.

There are a number of techniques that can be adopted to test for these unit roots and hence for nonstationarity.

3.5 Nonstationarity tests

The two methods adopted to test for nonstationarity are as follows:

3.5.1 Augmented Dickey-Fuller Test

It serves as an extension of the standard Dickey-Fuller Test to incorporate lags.

The simple DF Test begins:

$$y_t = \rho y_{t-1} + \mu_t$$

Testing the null hypothesis of $H_0: \rho = 0$ against an alternative, $H_1: |\rho| < 1$

A regression is then done on:

$$\nabla y_t = (\rho - 1)y_{t-1} + \mu_t = \delta y_{t-1} + \mu_t$$

where ∇ is the first difference operator. A unit root test is equivalent to finding $\delta = 0$ equiva $\delta = \rho - 1$

The ADF is tested in the same way, but the model is extended to include lags of on the right hand side. This then becomes:

$$\Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} + \dots + \delta_{p-1} \Delta y_{t-p+1} + \varepsilon_t$$

where α is a constant, β a coefficient on a time trend and ρ the lag order for the process.

The ADF is preferable to the simple process as it incorporates lags which are of importance in testing stationarity. One of the downsides of this is that lags have to be pre-determined, however for this a number of procedures have been devised (Ng & Perron, 2001). For this regression, the Akaike information criteria (AIC) is adopted.

3.5.2 Phillips-Perron (PP) Test

This builds upon the DF test, however instead of instead of adding higher-order lagged terms, they undertake a non-parametric correction of the t-test statistic to account for autocorrelation.

The test fits the following regression:

$$y_t = \alpha + \rho y_{t-1} + \mu_t$$

The statistic for this is:

$$s_n^2 = \frac{1}{n-k} \sum_{i=1}^n \hat{\mu}_i^2$$

where:

μ_i is OLS residual

n is the number of observations

k is the number of covariates

From discussion of these tests, the decision of whether unit roots are present will be based on the results of both the ADF and PP tests.

3.6 Unit Root Test Results

For these tests the computer package EViews 7 is used. The results of these are as follows:

| Variable | Test statistics | 5% critical value |
|----------|------------------|-------------------|
| | Level | |
| LQ | -1.229 | -2.905 |
| LY | -1.591 | -2.90 |
| LPb | 0.604 | -2.905 |
| LPs | 3.994 | -2.90 |
| | First Difference | |
| LQ | -20.275* | -2.906 |
| LY | -5.064* | -2.906 |
| LPb | -6.063* | -2.906 |
| LPs | -4.839* | -2.906 |

Table 3.1: ADF Test Results

*denotes significance at the 5% level

| Variable | Test statistics | 5% critical value |
|----------|------------------|-------------------|
| | Level | |
| LQ | -1.192 | -2.904 |
| LY | -2.085 | -2.904 |
| LPb | 0.343 | -2.904 |
| LPs | 3.255 | -2.904 |
| | First Difference | |
| LQ | -12.286* | -2.904 |
| LY | -14.830* | -2.904 |
| LPb | -8.513* | -2.904 |
| LPS | -7.794* | -2.904 |

Table 3.2: PP Test Results

*denotes significance at the 5% level

The null hypothesis is that a Unit Root is present and the variable is non-stationary.

When Level, the Test statistic >5 Critical Value meaning that we fail to reject the null hypothesis of a unit root being present. However once integrated to the first difference, this subsides. This highlights how the variables are stationary in their differenced form. A cointegrating vector may be present and as such it is necessary to test for this.

3.7 Testing for cointegration

3.7.1 Engle-Granger approach

(Engle & Granger, 1987) first looked at establishing this relationship through a method of running an OLS regression on the variables' residuals. Whilst it should be acknowledged that their approach was innovative it is not without drawbacks, as highlighted by (Stock, 1987), who brings up the issue of the t-ratio bias in their OLS cointegration estimates. Further, when it comes to testing for cointegration there is an issue that the estimation of parameters used won't be efficient. (Sorensen, 2005) also argues that the Engle-Granger approach does not circumvent this problem.

3.7.2 Johansen approach

A technique that is now ubiquitous in the literature is proposed by (Johansen, 1988). With multivariate systems he suggests specifying the dependent variable as an unrestricted vector autoregression (VAR). This is favourable to Engle & Granger's approach as it doesn't require imposing strong a priori restrictions; such as particular structural relationships and/ or exogeneity of some of the variables (Harris, 1995).

Through utilising a reduced rank model, Johansen alleviates the above problems. Whilst not being without its shortcomings (Sorensen, 2005, notes that bias may enter as all variables if one is flawed as they are modelled at the same time), its dominance in the literature merits its inclusion.

Since finding that the variables possess a unit root, and that they aren't present in a differenced form, it is appropriate to undertake a Johansen Cointegration Test for the model mentioned. Again, statistical program EViews 7 is used.

There are a number of considerations required for computation of the Johansen Test. In deciding the lag length that should be considered, again under the influence of (Ng & Perron, 2001) the Akaike (AIC) approach was adopted as it removes the necessity to predetermine lag length.

A further consideration that is required is whether to allow for a linear deterministic trend in the Cointegration Test. From visual representation of the variables, it becomes clear to test with an intercept and trend in the cointegration equation.

3.7.3 Johansen Test results

There are two results that emerge from the Johansen Test: Trace and Maximum Eigenvalue. The Trace statistic is testing the null hypothesis of there being at most r cointegrating relations and the Maximum Eigenvalue statistic has null hypothesis of r cointegrating relations against an alternative of $r + 1$ (Johansen, 1991). The results of the regression are as follows:

| Hypothesized No. of CE(s) | Eigenvalue | Trace Statistic | 0.05 Critical Value | Prob.** |
|---------------------------|------------|-----------------|---------------------|---------|
| None | 0.631992 | 112.1460 | 63.87610 | 0.0000 |
| At most 1* | 0.266123 | 44.16972 | 42.91525 | 0.0372 |
| At most 2 | 0.224450 | 23.12957 | 25.87211 | 0.1057 |
| At most 3 | 0.082367 | 5.845109 | 12.51798 | 0.4802 |

Table 3.3: Unrestricted Cointegration Rank Test (Trace)

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

| Hypothesized No. of CE(s) | Eigenvalue | Trace Statistic | 0.05 Critical Value | Prob.** |
|---------------------------|------------|-----------------|---------------------|---------|
| None | 0.631992 | 67.97624 | 32.11832 | 0.0000 |
| At most 1* | 0.266123 | 21.04015 | 25.82321 | 0.1889 |
| At most 2 | 0.224450 | 17.28446 | 19.38704 | 0.0984 |
| At most 3 | 0.082367 | 5.845109 | 12.51798 | 0.4802 |

Table 3.4 : Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

It is apparent that there is a disagreement in the results and as such, discretion is required. Scrutinising the figures reveals that the Trace test statistic is only marginally significant at two cointegrating equations whereas the Maximum Eigenvalue statistic is more secure in its prediction of one equation. In the absence of cordial numbers, the results are interpreted as having one cointegrating equation.

With a cointegrating equation where variables are $I(1)$, this implies that the results obtained will not behave in a spurious manner and hence the Long Run model for Beer Demand in the UK can be interpreted as:

$$Q = 2.26769LY - 4.57367LPb + 0.80701LPs$$

3.8 Error Correction Model

In order to account for the short term behaviour in beer demand it is necessary to incorporate an Error Correction Model (ECM). Again, it is appropriate to adopt Johansen's approach utilising the technique of a Vector Error Correction Model (VECM), designed for VAR models with nonstationary variables that are known to be cointegrated.

This is a one step approach that again supersedes the Engle Granger methodology. As (Maysami & Koh, 2000) describe, the VECM is favourable because it works in one step, rather than two, removing the requirement for specific variables to be normalised. This is more efficient than Engle-Granger, where errors in the first step are carried over to the second.

3.8.1 Johansen's VECM

After setting up a VAR, some diagnostic tests are needed to check how it behaves. Firstly, the autoregressive (AR) roots. If the VAR is stationary then all roots will have a modulus of less than one. With this condition met an appropriate lag length must be identified and through using the VAR Lag Length Criteria specification provided by EViews the results are:

| FPE | AIC | SC | HQ |
|-----------|------------|------------|------------|
| 2.69e-11 | -12.98667 | -12.85286 | -12.93387 |
| 7.88e-16 | -23.42640 | -22.75736 | -23.16242 |
| 4.66e-16 | -23.95711 | -22.75283 | -23.48194 |
| 2.40e-16 | -24.63516 | -22.89565 | -23.94881 |
| 1.09e-16 | -25.45163 | -23.17689* | -24.55410* |
| 9.84e-17* | -25.60184* | -22.79187 | -24.49313 |
| 1.12e-16 | -25.53913 | -22.19392 | -24.21923 |

Table 3.5: VAR Lag Order Selection Criteria

This inclines towards having lag length at five variables, in keeping with the AIC criteria that was adopted in the initial model.

Undertaking the same tests as before, it is found that the VAR has one cointegrating vector after running the Johansen Test for Trace Test and Maximum Eigenvalues and in keeping with (Juselius, 2000) it is recommended that the lag length of the VECM is one less than the VAR. In this instance the VECM is modelled with four lags.

3.8.2 VECM Results

The results of the VECM calculated are as follows:

| Cointegrating Eq: | CointEq1 |
|-------------------|--------------------------------------|
| LQ(-1) | 1.000000 |
| LY(-1) | -0.694900 (0.38666) [-1.79718] |
| LPB(-1) | 2.071194 (0.97764) [2.11857] |
| LPS(-1) | -0.562099 (0.68958) [-0.81513] |

Table 3.6: Vector Error Correction Estimates

Sample (adjusted): 6 71

Included observations: 66 after adjustments

Standard errors in () & t-statistics in []

What is of importance here is that the coefficients of the short term correction are of the opposite magnitude to the long run model. This accounts for the short term deviation from the long term trend for the previous lag, which is in keeping with what is expected.

3.9 Discussion of quantitative methodology

Before continuing, it is appropriate to evaluate the quantitative methodology that has been used.

This regression has looked at the aggregated demand for beer whilst detailed analysis will be on the how individual brewers act within the market; this could present an issue when interpreting the elasticities. (Slade, 2004) discusses the issue of price elasticity. "When a product is homogenous, a single price prevails in the market. There is therefore just one price elasticity of demand – the own-price elasticity – to estimate. When products are differentiated, in contrast, the number of brands can be very large ... and the number of elasticities is formidable". In the case of the current regression, these different elasticities are not picked up, instead there is an aggregated figure.

It could therefore be more applicable to use methodology used by (Hausman, Leonard, & Zona, 1994); a study that provides elasticity estimates for beer as a group and also for different beer brands. The reported own-price elasticity estimates for different beer brands range from -3.8 to -6.2, and the estimated own-price elasticity for beer as a group at -1.3. This is to be expected with firms facing substitutes within the group as well as other product types.

Whilst this type of analysis would be more insightful for the study, there are constraints from the data. The authors gained access to the largest US brewers, using detailed metrics of beer type and number of stores these were sold in. This is unfeasible in the case of small UK brewers and so an aggregated form was taken. Nonetheless, the final results and supporting literature act to support good interpretation of these results.

3.10 Discussion of qualitative methodology

This section briefly describes the methodology for obtaining the qualitative material used in analysis.

As this is a paper asking how small brewers survive, firms were contacted directly in search of an answer. This was done

in two ways; first, through conducting a generic questionnaire that was sent out to over a hundred small brewers (contacts were found from the SIBA website and a survey was sent out via e-mail) and second through one-on-one interviews. Full details of these are in Appendices A, B and C.

Secondary data were also sourced through investigation of journals outside the economic literature. This was achieved through an initial electronic search, and then systematic exploration of the references

When drawing up the survey, it was decided to utilise a mixed method approach to gather both quantitative and qualitative responses. The initial intention was to assemble an average cost curve for small brewers. Unfortunately, the lack of clear responses rendered this unworkable. An area of fruitful return however occurred with the qualitative responses. Here, open ended questions were distributed to allow the brewers to express, for example, their “ethos to ensure you thrive as a business” and how they “differentiate against your competitors”.

In hindsight, it can be noted that the initial quantitative questions required effort which often deterred respondents from answering them. This meant that the later, arguably easier, questions based on opinion rather than fact, were not answered.

Separate face-to-face interviews were arranged with Managing Directors of two small breweries. These were semi-structured interviews allowing flexibility from both researcher and respondent to enhance the opportunity of garnering rich textual data. Subsequent interpretation was undertaken by the researcher. On both occasions conversations were recorded and later transcribed. Again, questions remained open to

allow the brewers to express the strategies that they adopted to survive and thrive. This method was beneficial in that a rapport could be built, allowing the interviewee to go into more specifics as well as asking for clarification when needed.

In terms of which brewers were selected, two were chosen for interview out of the five enquiries made in the West Midland and North Eastern areas. It was decided that a firm operating in each of these geographical markets would broaden the scope to gain a fuller picture for the whole UK. Whilst it is not appropriate to draw generalisations from just two sources, the results align with survey responses from brewers throughout the UK. This suggests that the depth that the interviews went into could plausibly have been found in other locations and so should be strongly considered.

Full consent was granted from the brewers conducting face-to-face interviews and it was agreed that survey respondents would remain anonymous.

Appendix 5: Data Sources

As mentioned, the sources for my data were as follows:

Q: ‘Beer and Cider – Historic Clearances and Revenue’ from HMRC. This covered monthly data from Jan-94 to Sep-11. Once manually converted to quarterly data and then again from hectolitres to barrels using the conversion [1hl = 0.611026 barrels]

Y: ‘Quarterly National Accounts Q3 2011’ from ONS

Pb: ‘Consumer Trends Dataset – Q3 2011’ from ONS

Ps: ‘Consumer Trends Dataset – Q3 2011’ from ONS

All data was accessed electronically.