

Simulating the Effects of Regulatory Change in the UK Pubs Industry

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Abstract

A 1989 Monopolies Commission Inquiry into the supply of beer claimed that Tied retail distribution by brewers' ownership of retail outlets (pubs) restricted consumer choice, excluding would-be competitors from brewing and retailing, and forcing up the retail price of beer. The inquiry recommended reducing large brewers' ownership of pubs. This was intended enable new entry into retailing and production, reduce wholesale and retail beer prices, and extend consumer choice. However, a 1993 Government review found that the outcome had been largely the opposite of these aims, and a further serious consequence was the closure of large numbers of pubs and a sharp fall in their values.

These unintended consequences need to be understood if such outcomes are to be avoided in other cases, and firms need good models to help anticipate the effects of regulatory change and discover appropriate strategic responses. Since in this case there are complex interactions and feedback effects between three distinct markets - (beer supply, pub retailing, and property) - models are needed that capture the dynamics of competition in each market as well as the interactions between them. This paper reports on the structure and results for a system dynamics model built to capture the growth of pub-owning firms, given different characteristics, incentives and behaviours. This forms the basis of a further model for the licensed property market as a whole. Data was derived from the Inquiry report and discussions with industry executives, but all such data was available at the time of the original inquiry.

Preliminary results demonstrate the mechanisms by which firms grow chains of pubs and show how the impact on property values and numbers might be assessed. The model also demonstrates the broader value of applying a system dynamic methodology to researching issues of industry structure, strategic management and business policy.

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The Structure and Regulation of U.K. Beer Supply.

In 1989, the UK beer supply industry was the subject of an inquiry report from the Monopolies and Mergers Commission (MMC, 1989). This inquiry was mostly concerned with the possible anti-competitive effects of the common industry practice whereby retail outlets (pubs) were restricted as to their beer purchases by brewing firms who owned them. This is a form of vertical integration which has long concerned economists and regulators alike (Williamson, 1975; Perry, 1989; MMC, 1990).

By international standards, the UK beer supply industry was until recently relatively fragmented. In 1985, 6 large firms accounted for 75% of output, with some 50 other small firms. As well as production facilities, most brewers operate regional or national distribution systems to supply both shops and the pubs/restaurants sector. Sites licensed for alcohol consumption (mostly pubs) accounted for about 85% of beer volume sales in 1986. Of the 80,000 such premises, 46,000 (57%) were owned by brewers. These 'Tied houses' source all draught and most packaged beer from the owning brewer. The remaining pubs are independent 'Free houses', free to buy drink from any source. These are usually owned by a private individual, although chains of Free pubs are increasingly being assembled by larger firms.

Brewers and others compete in two principal markets - the wholesale market for the supply of beer and other drinks to pubs, and the market for the retail sale of beer, other drinks and other products. However, there is an important third market in which integrated brewers, individuals and pub chains compete - the market for On-licensed property itself. This market is substantial. The large brewers would all feature in the UK's top 10 property groups if quoted as such, with total assets of some £20bn. Any change affecting this market is thus of considerable interest, not only to the brewers, but also to the thousands of publicans whose livelihoods depend on it.

The brewers do not always operate the retail business of their pubs themselves. Only larger pubs, whose retail profits justify the administration costs, are directly managed by the owning brewer. Most are run by tenants who pay a rent. Although independent entrepreneurs, they are required to source beer from their brewer-landlord. Free pub retailers may either purchase a property through which to trade, or rent one from a brewer or other landlord. Larger firms may run groups of pubs along similar lines to, say, a chain of supermarkets, or again may rent pubs out to individual publicans.

Any would-be pub retailer needs two main inputs - products to be sold to consumers, and the property in which to make that sale. Since the markets for these inputs differ substantially, different bundles of capabilities and resources would be held by firms who operate in each (Grant, 1991). Indeed, by 1986 certain firms had already chosen to operate largely in one or other of these markets. This paper reports on a model of the licensed property market, a sector which has come into sharper focus since the MMC inquiry, with a number of firms aiming to operate solely as licensed property landlords. Two firms led the way in building activity in this sector, Brent-Walker's PubMaster division and Grand Met's Innpreneur business unit. Both now own many hundreds of sites, and some 100 other firms now operate anything from 10 to 200 sites.

The MMC inquiry concluded that incumbent brewers' ownership of Tied pubs was a large barrier to entry by would-be beer suppliers and by new retailers alike (Bain, 1956), and recommended that these firms be forced to sell all but 2,000 of their sites. This would affect only the largest brewers. The Beer Orders (H M Government, 1989) fell short of this proposal, requiring the brewers only to release the beer supply Tie on half of the pubs they owned above a base of 2,000. A brewer with 6,200 pubs, the average for the majors, would therefore have to free 2,100 of these. The brewer could retain ownership, but offer long leases on the pubs to individuals or firms. Alternatively, the pubs

could be sold outright onto the property market. Both routes have been adopted by the large firms. What the inquiry did not address, however, was the likely impact on the property market of their proposals, and in particular the prospects for survival of firms who took the opportunity provided by the releasing of over 10,000 pubs (Williamson and Verdin, 1991)

A MODEL OF THE LICENSED PROPERTY MARKET

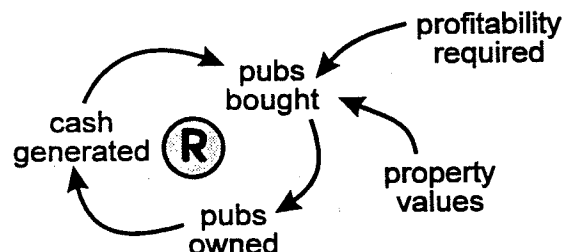
This model was developed from an outline of the policies and concerns of the participant firms and their interaction with the market in which property is traded, derived from the MMC inquiry report and from discussions with industry executives (Richardson et al, 1989; Forrester, 1980).

The licensed property market reflects the combined activities of firms with a variety of strategic characteristics (strategy, management policy, efficiency, and any interests in pub retailing and beer supply). The relative size and number of these different types of firm alter through time, and have certainly been altered by the effects of the Beer Orders. The focus of this model is thus on understanding the interactions between the different types of firm and the licensed property market itself. This market exhibits many features to be found in both the residential and general commercial property markets. Buyers are most active when property prices are thought to be low relative to income. Property values are bid up, and buyers' activity is stimulated by the belief that asset values will rise. This enthusiasm may persist beyond the point where property values exceed what is really justified by income potential, leading to a boom-and-bust, with property transactions falling, both in number and in value. After a period of falling or stagnant property values, property again becomes an attractive investment, and the cycle starts again.

The licensed property market, however, includes some unique features. The number of sites is largely limited by licensing and planning restrictions. Most of these sites, generally the better ones, have long been owned by the integrated brewers, who have tended to hold them indefinitely. The greatest activity has therefore been amongst a fringe of less attractive sites. Since these sites have not offered much advantage to the integrated brewers (relative to the sites they already owned), independent publicans have been the most active participants in the market. Pub-owning chains are a relatively recent phenomenon, whose activity has been considerably boosted by the Beer Orders.

The dynamic behaviour of the licensed property market depends fundamentally on the growth strategies being pursued by the different types of owner. Whilst the market was partly stabilised by the integrated brewers' estates, the dynamics would have been determined by the investment enthusiasm of independent publicans. A dynamic model of the market therefore needs at its heart a means of capturing the growth mechanism of a pub-owner (Figure 1)

Figure 1: The growth cycle for a pub chain.



Given an initial number of pubs owned, a certain amount of cash is generated. If sufficient cash is accumulated, the owner buys further pubs, thus boosting the cash generated. The cash generated depends on the quality of the sites owned. Similarly, pubs are only bought if the quality of those available is sufficient to generate the profitability required.

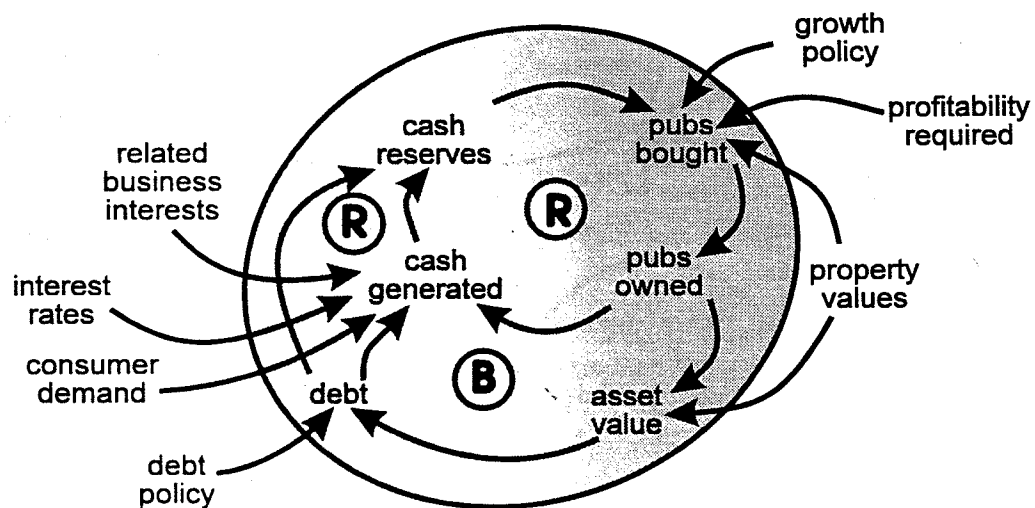
The motives of the various types of pub-owner differ considerably in the extent to which they reflect this simple model. Individual Free traders may seek to add to their single property, and attractive property values encourage new individuals to enter the market. Pub chains with retail operations most directly reflect the dynamics of the model given above. Many such firms started during the 1980s,

and have been boosted by the effects of the beer orders. Pub chains who lease to tenants reflect the model in part, but their leases generally allow for rent revisions only every 3-5 years, so their cash generation is lower and more stable than that of retail pub chains. However, they incur few of the overheads of their retail counterparts. Integrated brewers can participate fully in the model, but for various reasons may choose not to do so. They may suffer a relatively poor average quality of sites, so that the cash generated appears not to justify any expansion. This effect may be exacerbated by the overheads they incur in controlling relatively large numbers of sites. They do have the benefit of upstream production profits on the beer supplied to their sites, but this may distract them from optimising the retail operations. Finally, these firms may have other uses for the funds generated by their pubs.

The practical behaviour of the basic model is thus considerably influenced by the policies of the particular management of each firm. As a simulation model was developed from this causal loop structure, these differences were tested with data appropriate to the different categories of firm.

More aggressive firms can use a further reinforcing effect to drive growth. The asset values of owned sites can be used as security for borrowings. Those borrowings can be added to the cash resources available, and thus boost the rate at which the firm can grow. The firm's cash generation from those additional sites is, however, reduced by the interest payments to be made on the incurred debt. Adding interest rates, pub profitability and various external features produces the model shown in Figure 2.

Figure 2: The effect of borrowing and external factors on the model of pub chain growth.



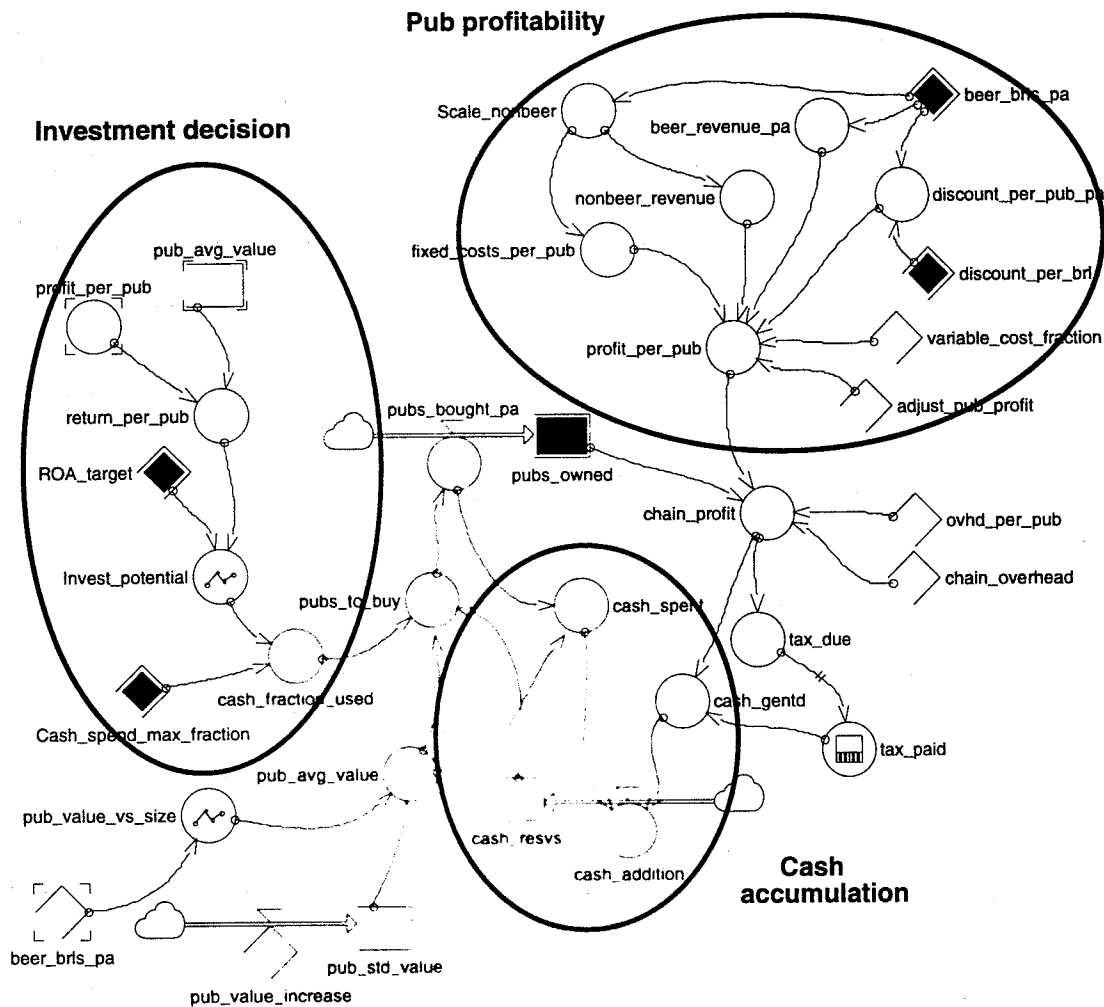
The chain growth model

The central model for the growth of a pub-owning firm reflects this feedback structure and was modelled in PowersimTM. Figure 3 shows the structure of this model before the debt effect is added. The 'pub profitability' sector computes the retail profit of the chain's pubs, given the average size in terms of beer volumes sold, the discount on beer purchases, and other revenue and cost data derived from the MMC's inquiry report. This pub profit, multiplied by the number of pubs owned and adjusted for chain overhead costs produces the chain's profit. After deducting tax in the year following, the 'cash accumulation' process is modelled. Cash generated is added to the reserves, and money spent on pubs is deducted. Growth is determined in the 'investment decisions' sector by both the average return on each pub above a required return and by the management's growth ambitions set by a maximum fraction of cash reserves they are prepared to spend on buying more pubs.

TM Powersim is the registered trade mark of Modelldata AS, Bergen, Norway.

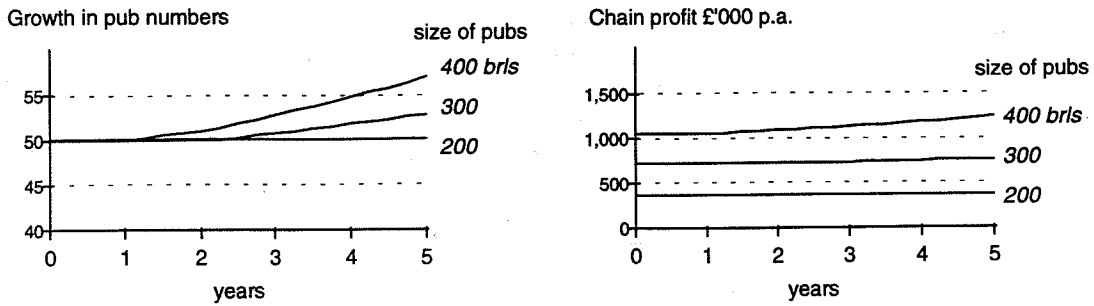
The performance of the firm is largely determined by the five highlighted variables. 'Pubs owned' sets the initial size of the chain. A larger chain of pubs achieves better recovery of overheads and so accumulates cash faster than a small chain. 'Beer brls p.a.' gives the size of the chain's average pub. Larger pubs generate disproportionately better returns than small ones, but there are diseconomies of management control in pub retailing. Larger pubs would also benefit from better buying terms. 'Discount per brl' reflects the buying power of the chain, and simply adds to the unit profitability of each pub. 'Cash spend max fraction' sets management's growth aims, being set low for conservative management or 1.0 (spend all available cash) for the most aggressive scenario. 'ROA target' sets the rate of return above which management is prepared to invest. The higher the excess return, the larger the proportion of the maximum cash limit management is prepared to spend. If returns are 10% above this target or more, all of the maximum cash spend is committed to buying pubs.

Figure 3: The chain growth model in Powersim with no debt.



The model was tested with data to reflect the different size and trading profiles of different categories of pub operator. As an example, the growth of a 50-pub chain is given in Figure 4. Variables were set at levels that are realistic for a typical pub chain - average pub size of 300 brls, discount of £40/brl, ROA target of 8% at the pub level and the most aggressive use of available cash. The figure shows the sensitivity of growth to the size of pubs owned. Small pubs simply do not generate sufficient cash to be reinvested into additional outlets.

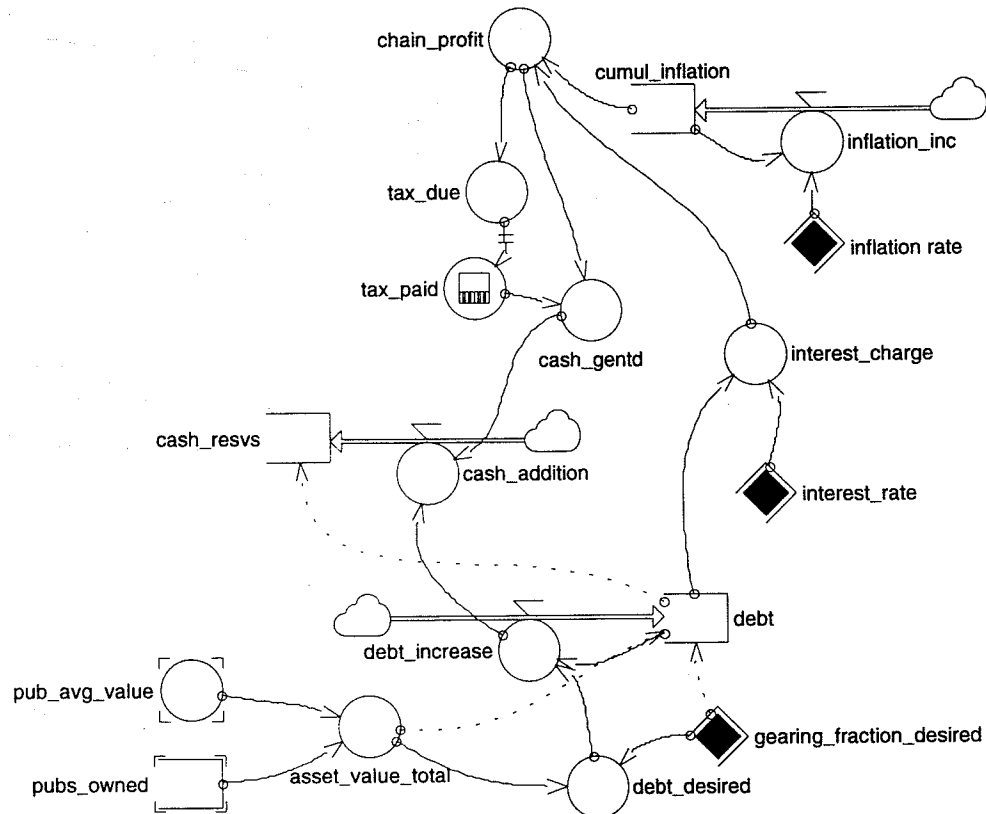
Figure 4: Sensitivity of chain size and profit to average pub size.



This model does not generate the rates of growth that have been achieved by the most aggressive pub-acquirers, since it is lacking the further key driving mechanism of debt. This effect is added simply with a stock variable that holds the debt of the firm (Figure 5). This level is set by a key policy variable - gearing target - that sets desired debt as a fraction of the asset value currently held. The increase in debt from period to period is added to cash resources, to be spent on more pubs according to the firm's growth aims. Interest charges are derived from the debt level multiplied by the current interest rate.

Debt also accelerates growth through the effect of inflation. Although inflation may often obscure the simplicity of system dynamics (SD) models, its role in property firms is critical, since income may rise with inflation, whilst the cost of interest on any given debt level may not.

Figure 5: Adding debt to the chain growth model.



This model can illustrate the powerful impact of debt with sensitivities to the policy variable - 'gearing fraction desired'. Figure 6 shows the impact that gearing has on the growth of a 50-pub chain of 300-barrel pubs.

The powerful impact of debt leverage on chain growth is clear, but the profit chart illustrates the steep price that must be paid. The firm's profit is depressed by the interest charges on the debt the firm takes on, to an extent that cannot be overcome by the increasing economies of chain scale. Note, though, that this result is only true for the particular values that have been taken for the average size of pub, discount levels and initial chain size. These combine to create average ROA for the chain that is below the rate of interest on debt. The importance of this effect is illustrated in Figure 7, which show chain size and profitability for different scales of average pub, given a standard gearing level of 50%.

Figure 6: Chain growth and gearing.

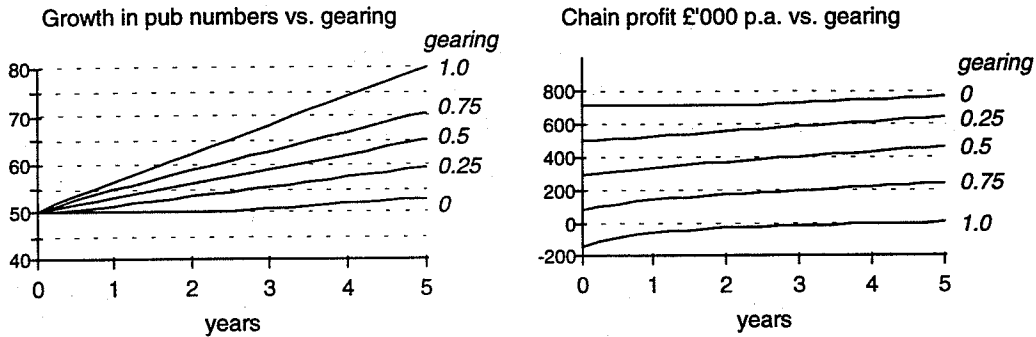
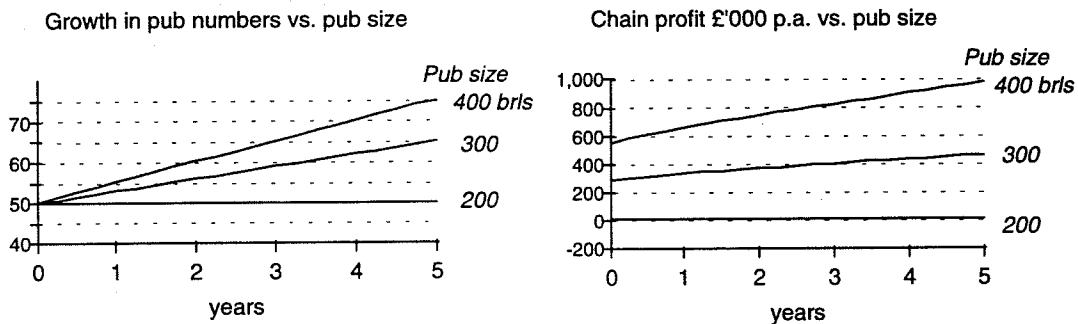


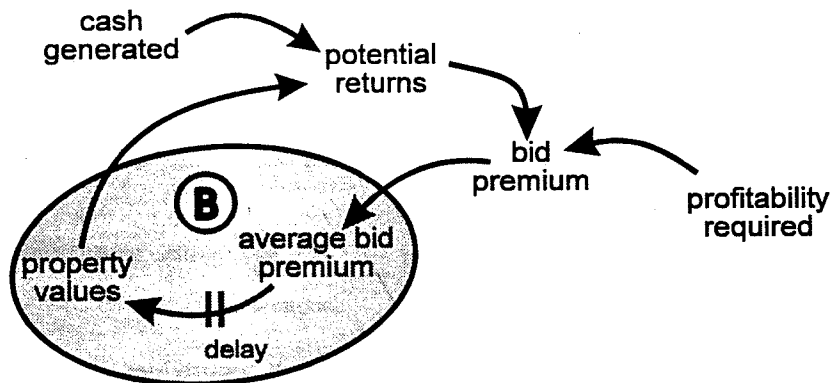
Figure 7: Impact of pub size on chain growth and profitability with 50% debt.



The licensed property market

Once the behaviour of the model for a single pub-owning firm has been modelled, the final stage is to represent the interaction between these firms and the property market (Figure 8).

Figure 8: The link between pub returns and market values.



Pub-owning firms compare current property market values with the profitability they believe they can achieve. If the market values are lower (higher) than they can justify, they will bid a premium

(discount) against market values. If many firms offer a premium, there will be upward pressure on market values and, after some delay, these will rise. Higher average values reduce the returns that pub-owners can achieve, so bid premia fall and upward pressure on values eases or may reverse.

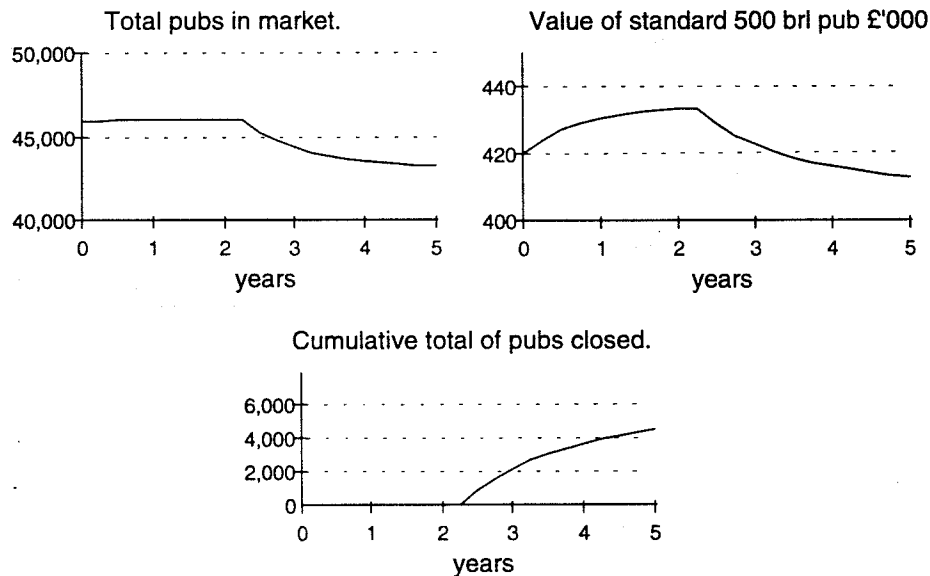
The model represents typical market values by a simple stock variable whose inflow/outflow reflects the weighted average of firms' bids. This value for an average pub is fed back into the growth model for each category of firm. If the profitability of pubs falls too far, none of the firms will be able to justify running those pubs and they will close.

The model includes the option of setting a number of different categories of firm, each with its own characteristics of pub size, chain size, gearing, growth targets, and so on. As an example of early data used to assess the impact of regulating to remove Tied pubs, the model was run with the following sets of rival pub firms.

Type of firm	Pubs per firm	Average size of pub (barrels p.a.)	Number of chains
Small independent pub chain	50	350	50
Large brewers' tied pubs	6200 initially, then 4,100	400	5
Large brewers' leased pubs	0 initially, then 2,100	200	5
Small brewers' pubs	240	400	52

Note that 'large brewers' leased pubs' is the number of pubs required by regulation to be freed from the beer supply Tie. Naturally, such a brewer would release its smaller pubs first, and the average size of 200 brls p.a. indicates the typical size of the smaller pubs owned by major brewers. Figure 9 gives the results of running the model with these data.

Figure 9: The effect on pub market values and numbers from reducing the number of Tied pubs owned by large brewers.



In the early years, the profitability of operating pubs encourages chains to grow. In year 2, though, the enforced release of 2,100 pubs for each major brewer is modelled by switching this number of pubs into the new category 'Large Brewers' leased pubs'. This depresses property values by some 5%, which should lead to the take-up of pubs by non-brewing firms. However, without the up-stream profits on beer supply, the profitability of these small pubs is insufficient to provide a return, even on

the depressed property value, and many of the pubs leave the market altogether at the same time as values are falling. Not all the 10,500 released pubs close, though, since lower values do allow some to be taken on by other operators.

Conclusions

The model constructed here has important implications for regulation of the UK pub market. Although freeing pubs from vertical ownership by major brewers would seem at first sight to encourage new entry by pub operators, there is an important unforeseen consequence - that the pubs released fail to be economically viable when removed from the production interests of their former owner. These pubs then depress the value of remaining pubs in the market. However, this process does not result in all the released pubs closing, so the remainder are absorbed by the remaining firms in the market.

More generally, the paper indicates the value of constructing models of industry dynamics as a means of testing out the possible effects of regulatory (or other) changes. This should be of interest both to the regulators themselves and to firms whose prosperity may be affected by such changes and who wish to experiment with alternative strategic responses.

Finally, the paper has broader implications for research into competitive strategy and business policy. It suggests that, as in the physical sciences, it should be possible to conduct research not by looking backwards at historic events, but by setting up software models of unknown future conditions and testing those models against alternative sets of events.

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