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Happy hour followed by hangover: Financing the UK brewery industry, 1880-1913

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HAPPY HOUR FOLLOWED BY HANGOVER: FINANCING THE UK BREWERY INDUSTRY, 1880-1913

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Happy Hour Followed by Hangover: Financing the UK Brewery Industry, 1880-1913*

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Abstract
In the last 15 years of the nineteenth century c.300 British brewers incorporated and floated securities on the stock market. Subsequently, in the 1900s, the industry suffered a long-lived hangover. In this paper, we establish the stylised facts of this transformation and estimate the gains enjoyed by brewery investors during the boom as well as the losses suffered by investors during the bust of the 1900s. However, not all brewery equity shares suffered alike. We find that post-1900 performance correlates positively with capital-market discipline and good corporate governance and negatively with family control, but does not correlate with indebtedness.

JEL classification: N23, N43, N83

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1. Introduction

There were two booms on the UK stock market which contributed greatly to its growth - 1886-1890 and 1895-1900.[1] Breweries were at the centre of these two booms, with many long-established breweries incorporating as public companies and floating securities on the stock market.[2] To illustrate the scale of this expansion - in 1885 there were only 12 incorporated breweries with securities traded on a stock market with a total paid-up capital of about £2 million, but by 1900, there were 308 breweries, with a total paid-up capital of over £165 million. This brewing boom, however, quickly turned sour for investors, with the industry in the doldrums for the first decade of the twentieth century. This expansion and subsequent downturn, which are the primary focus of this article, had a substantial and long-lasting effect on the UK brewing industry and on the development of the UK capital market.

In this paper, we firstly establish the stylised facts of the brewery booms in terms of the number of breweries incorporated and the capitalisation of the industry over the 1880-1913 period. Secondly, we examine how brewers maintained control of their companies, whilst raising large sums of capital on stock markets. Using detailed ownership records, we establish the following typography of ownership and capital structure - (a) breweries which were closely held and 40 per cent or more of their capital structure was debt; (b) breweries which had relatively diffuse ownership and very little in the way of debt finance; and (c) breweries with relatively diffuse ownership and which had a capital structure consisting of circa 40 per cent debt. Our evidence suggests that closely-held ownership and substantial debt finance was the most common type.

Thirdly, we examine returns on brewery securities during the boom and bust phases experienced by the industry. We find that there was a boom in the prices of all brewery securities in the 1890s, but particularly in ordinary shares. In the bust phase, investors in brewery securities suffered substantial losses in the 1900s.

Finally, we attempt to explain the variation in post-1900 performance of breweries by looking econometrically at the relationship between stock returns and indebtedness, family ownership, corporate governance, access to credit, and capital-market discipline. From our evidence, indebtedness does not appear to be a covariate of stock returns, but there is some evidence that access to credit is a covariate. However, capital-discipline and good corporate governance are positively related with stock returns, whilst family ownership is negatively related with the performance of preference shares.

Why is a study of the financing of the brewing industry in this era interesting? Firstly, the general perception is that breweries were the typical Chandlerian firm in that they were family-controlled and thus are believed to have performed poorly.[3] Using detailed ownership records, we are able to shed some light on how families maintained control of their breweries after incorporation and flotation of their securities. Then, in our empirical work, we are able to ascertain whether the post-1900 performance of brewery shares was correlated with the presence of family ownership. Notably, we find that family ownership was associated with poor performance of preference shares, which would largely have been held by non-family members.

Another reason that a study of the breweries in this era is interesting is that from the perspective of the development of the UK capital markets, the two brewery booms were at the centre of the 1886-1890 and 1895-1900 stock-market booms and, to date, the historiography of British capital markets has said little about these booms. In addition, most companies which had floated on the stock exchange prior to the brewery boom were new ventures.[4] However, the breweries (along with iron and steel companies) were conversions of long-established firms, and from this time onwards, the vast majority of firms which floated on the stock market were of this nature. Thus, the brewery industry was a central defining influence at the genesis of the modern-day initial public offering.[5] The brewery sector is also

interesting from a capital-markets-development perspective because it was the first sector outside of railways where there was extensive use of preference shares and debentures.[6]

A further motivation for this study is that there are wider lessons for financial economics. The ease with which debenture finance could be raised contributed to the overvaluation of public houses, with tied-houses in London trebling and quadrupling in value in the space of a few months in the late 1890s. Ironically, the debentures themselves were largely secured on the value of these public houses. Thus, the brewing industry presents us with a case study of the role of credit in sustaining asset price booms.[7]

A final reason as to why a study of brewery finance in this era is interesting is that the conversion of the brewers is a good example of the unintended consequences for the stock market and investors of government intervention in an industry. Under the influence of the politically-powerful temperance movement, national and local governments had restricted the number of on-licenses which were issued and threatened to further contract the supply of on-licenses. This greatly pushed up the price of on-licenses and led to a scramble for public houses by breweries, who were keen to ensure a retail outlet for their beer.[8] This scramble was one, if not the chief, reason for the brewery booms.

The article is structured as follows. Section two examines the background to the brewery booms and the reasons breweries floated on the stock market. Section three establishes the stylised facts of the expansion of the brewery industry by providing estimates of incorporations and industry capitalisation across the 1880-1913 period. Section four analyses how brewers were able to raise finance from public markets whilst maintaining control. Section five examines the annual returns on brewery shares and debentures across the 1880-1913 period. Section six attempts to explain the cross-sectional variation in brewery performance in the post-1900 era. Section seven is a brief conclusion.

2. Coming to the market

The majority of the companies which floated on the London and provincial stock markets prior to the 1880s were companies which floated from scratch i.e., the founders sought finance from the capital markets right from the company's inception.[9] However, in the last two decades of the nineteenth century, there was an increasing number of companies which were viewed as 'conversions' i.e., long-established private companies or partnerships which went public by raising capital.[10] The brewing industry was one of the largest conversion industries. Beginning with the flotation of Guinness in 1886, there were two brewery flotation booms before the end of the century.[11] Why did breweries need to raise capital from public markets?

In the historiography of the British brewing industry, there are several reasons given for this phenomenon. The chief reason given is that the brewing industry faced two challenges from the 1870s onwards. First, there was a decline in beer sales and an increase in competition amongst brewers. Second, the rise of the evangelical-inspired temperance movement resulted in calls for prohibition or constraints on the brewing industry. This movement was very influential, gaining some influence over parts of the Liberal party in Parliament.[12] These challenges led brewers to take control of their retail trade in order to safeguard the market for their beer.[13] This meant that brewers needed to acquire on-licenses to increase their number of tied houses.[14] However, the cost of acquiring on-licenses was substantial. First, in spite of a rapidly-growing population, there was a diminishing supply of public houses due to a temperance-movement-inspired restriction on licensing.[15] Second, nearly every brewer was following the same strategy, which pushed up the prices of the limited supply of on-licenses.[16] Therefore, the only way most breweries could finance the purchase of a substantial network of tied houses was by coming to the capital market to raise finance.[17]

The scramble for licensed property, termed the Brewers' War, resulted in the doubling, trebling and even quadrupling in the valuations of licensed public houses.[18] The *Financial Times* reported that it was commonplace to pay £10,000 for a tied house - £1,000 of this covered the actual value of the property and the other £9,000 was for the license, which had no guarantee of having its renewal supported.[19]

Another reason why breweries needed new capital was that they needed to modernise and implement new technologies such as steam power, refrigeration and bottling.[20] These technologies increased the optimum scale of the brewery and with it the need for finance.[21]

For some brewers, the reasons for raising capital from the public may have been to partially cash out and ease the managerial burden of running a large brewery; this may have been part of the reason for the flotation of Guinness.[22] Indeed, some brewers may have had more foresight than others in that they anticipated the legislative attack on the brewery industry in the form of increased taxation, licensing restrictions, and regulation. These perceptive brewers may have taken advantage of the flotation booms and cashed out their ownership at the top.

One advantage to going public was that it ensured the spread of ownership in a controversial industry – tens of thousands of small investors had a stake rather than a small number of prosperous brewers.[23] This may have helped influence public support for the industry and at the same time made it more difficult for politicians to attack it. Notably, shareholders were encouraged to lobby MPs and to vote against pro-temperance candidates in general elections.[24]

3. The stylised facts of the expansion

Whenever a brewery wanted to raise capital from the public, it converted from its partnership status and incorporated under the 1862 Companies Act. Figure 1 documents the number of

domestic brewery incorporations in the UK from the 1860s until the end of the nineteenth century. As can be seen from Figure 1, before the flotation of Guinness in 1886, very few breweries had raised capital on the stock market. Following the Guinness flotation, there was a brewery promotion boom which lasted until 1890. A second promotion wave started in 1894, with 95 breweries incorporated in 1896 and 1897 alone.

<<INSERT Figure 1>>

Table 1 shows the capitalisation of domestic brewing companies in 1885, 1890, 1900 and 1913. The first thing to note from Table 1 is the effect of the two promotion booms. The 1886-90 boom resulted in a substantial change in the number of breweries and in brewery capital. This boom occurred in an environment where there were not a lot of other sectors coming to the market.[25] The 1894-99 boom resulted in a huge increase in the number of brewery companies and brewery capitalisation, but this occurred in the context of expansion in the wider stock market.[26] By 1913, based on the data in Table 1 and Michie's figures for the London market in 1913, breweries constituted about five per cent of the UK equity market.[27]

<<INSERT Table 1>>

The second thing to note from Table 1 is that preference shares and debentures became popular sources of finance for breweries. The ratio of preference shares to ordinary shares for the median (mean) company in 1890 was 0.84 (0.76) and in 1900 it was 1.00 (1.11), and in 1913 it was 1.00 (2.96). In other words, the equity of the median company was half ordinary and half preference shares. The ratio of debt (debentures plus mortgages) to total equity capital (ordinary plus preference shares) for the median company moves from zero in 1885, to 0.45 in 1890, 0.80 in 1900, and 0.93 in 1913.[28] This suggests that the first expansion phase was mainly financed by equity capital, whereas the 1894-9 boom was financed more by debt than equity finance. Indeed, the mean debt-to-equity ratio in 1900

meant that for every £100 of equity finance, breweries carried £86 of debt – these were highly-leveraged companies.

To get some idea of the market value of brewery securities, we gathered data on every domestic brewery security reported in the *Investor's Monthly Manual* (*IMM*). This manual reported security prices and the amount of issued capital for companies which had actively traded securities.

Figure 2 reports the number of brewery securities reported in the *IMM*. Four things are worthy of note. First, the number of companies with securities reported in the *IMM* was just over one third of the companies reported in the *Stock Exchange Official Intelligence* (*SEOI*). The reason for this difference was that many breweries listed in the *SEOI* were small affairs, whose securities were not actively traded and were therefore of little interest to the majority of investors at the time. Second, the expansion of the market for brewery securities was extremely rapid during the 1894-9 boom, with the standout feature being the substantial increase of debenture capital. Third, the number of securities peaked around 1901 and then dwindled slowly until 1913. Fourth, during the 1894-9 boom, the practice of companies issuing multiple types of debentures and preference shares emerged.

<<INSERT Figure 2>>

Figure 3 plots the annual paid-up capital of breweries which were reported in the *IMM*. The first thing to note was that the *IMM* in 1900 contains 75.2 per cent of the paid-up equity capital and 48.4 per cent of the debenture capital reported in the *SEOI* (see Table 1). The second thing worthy of note was the huge increase in capitalisation of the breweries during the 1894-9 boom, with debenture capital experiencing the greatest increase. Finally, the book value of brewery debentures quoted in the *IMM* in 1900 was almost equal to the total book value of brewery equity. This, taken with the evidence above, suggests that the expansion of the breweries was very much financed by debt.

<<INSERT Figure 3>>

Figure 4 shows the annual market value of brewery securities. Two things are worth commenting upon. First, the growth in the total market value of breweries up to 1900 was mainly driven by the issuance of new debentures and preference shares, whereas the growth in the market value of ordinary share capital was mainly driven by ordinary share capital appreciating in value. Second, there was a fall in the market value of all securities in the 1900s, which, as can be seen from Figure 3, did not correspond to a fall in the paid-up value of these securities; this fall represents the hangover – the poor performance of brewery securities after 1900.

<<INSERT Figure 4>>

4. Raising finance whilst maintaining control

Having established the stylised facts of the expansion of the brewery sector, we now ask why breweries had the particular capital structure they did, with substantial debenture capital and preference shares rather than ordinary shares, which up until this point in time had been the traditional instrument used by most business enterprises to raise capital on public markets. We then move on to look at the concentration of voting rights in a variety of breweries to see how much control rested in the hands of the largest owners.

Much of the historiography of brewing suggests that brewers wanted the best of both worlds – to get capital to expand their business without giving away any control.[29] In addition, given that brewing was a relatively profitable industry up until circa 1900, brewers would have been reluctant to share future profits with 'new' shareholders, consistent with the predictions of the pecking-order model of capital structure.[30] How did brewers achieve these ends? Notably, unlike companies which had been floated earlier in the century, the voting rights attached to the ordinary shares of breweries did not skew voting in favour of minority

shareholders by having graduated voting and an upper limit on the number of votes any one shareholder had.[31] Indeed, the vast majority of brewing companies in 1900 had one-share-one-vote structures.[32] Ultimately, to achieve their ends, many brewers did not float their ordinary shares, preferring instead to issue preference shares and debentures.

Investors in Victorian Britain were familiar with preference shares – they had been issued by railways from the middle of the nineteenth century onwards, but were not used much by other companies until the 1890s.[33] However, to characterise preference shares as non-voting and brewery preference shareholders as having no say in governance is inaccurate.[34] For some companies, this clearly was the case e.g., Bass, Ratcliff and Gretton's voting regime stated that "the preference stock confers no voting right".[35] However, some companies gave preference shares the same voting rights as ordinary shares, whereas others assigned different rights e.g., Nalder and Collyer's Brewery Company assigned one vote to every preference share and two votes to ordinary shares.[36] Others assigned one vote to both ordinary and preference shares, but preference shareholders could only vote under certain conditions, which usually were (a) on reduction or increase of capital, (b) on winding up of the company, or (c) if the dividend on their shares was in arrears.[37] In terms of the 260 brewing companies listed in the 1900 *SEOI* which had preference shares and reported the voting rights attached to them, 58.5 per cent afforded preference shares the same voting rights as ordinary shares, 7.3 per cent assigned different voting rights, 29.6 per cent afforded preference shares voting rights under certain conditions, and 4.2 per cent conferred no rights on preference shares.

Table 2 reveals that breweries where preference voting rights were the same as ordinary voting rights were about the half the size of and slightly older than those breweries where the rights of ordinary shares exceeded those on preference shares. This suggests that small breweries, where ordinary shares were more likely not to be publicly traded, had to

give preference shareholders voting rights in order to attract capital. Large breweries usually had their ordinary capital traded on public markets and were therefore much less likely to give preference shares the same voting rights as ordinary shares. As can be seen from Table 2, the amount of leverage is uncorrelated with the voting rights of preference shares, which implies that the voting power of preference shareholders had no bearing on capital structure. In terms of family ownership, Table 2 suggests that although 55 per cent of family firms gave preference shareholders the same rights as ordinary shareholders, non-family breweries were more likely to give equal rights.

<<INSERT Table 2>>

Consequently, in the case of some breweries, issuing preference shares may not have restricted control to ordinary shareholders and in the case of many breweries, the voting rights of ordinary shares would have been heavily diluted in the event that the dividend on preference shares fell into arrears. So what then was the advantage to brewers of issuing preference shares? One possibility is that the fixed dividend of preference shares was attractive to brewers who did not want to share increased future profits and who were limited by the extent of their tangible assets in terms of the amount of debentures which they could issue.

As noted in the section above, the other popular method used by brewers to raise finance was to issue debentures i.e., bonds secured on the assets of the company which paid a fixed coupon. Railways had issued debentures from before the 1860s, but the UK debenture market experienced substantial growth from the late 1860s onwards and the brewery industry was one of the first sectors outside of railways to adopt debentures as a method of finance – by 1900, 33 per cent of the domestic debentures listed in the *IMM* were issued by breweries.[38] The growth of the debenture market was given a fillip by the legal innovation of the floating charge, whereby a creditor was granted security against present and future assets of the

company, but was prevented from interfering with the firm until it entered bankruptcy.[39] The floating charge made debentures attractive to brewers because they maintained control of their company. Debentures were also attractive to investors because they were easily secured on the brewery's fixed capital – its brewery and its freehold tied property.[40] However, during the brewery boom of 1894-9, the *Financial Times* cautioned that debentures were being issued by breweries to the full extent of their tangible assets, and given that tied houses were being purchased at inflated values, there was little safety margin for debenture-holders.[41]

The downside of issuing debentures for brewers was that regular coupon payments had to be made; otherwise the brewery would be pushed into bankruptcy. However, such was the profitability of brewing and the optimism of brewers in the 1890s that brewers appear to have had no qualms in issuing large amount of debentures secured on the brewery's assets.

How much control did brewers maintain when they incorporated and floated securities on the stock market? The 1862 Companies Act, which breweries established under, required companies annually to return a list of their shareholders (known as Form E) to the Registrar of Companies. Prior to 1970, when a company was dissolved, its records were placed in Companies Registration Office files, which are presently located at the National Archives at Kew (BT31 series) and the National Archives of Scotland (BT2 series). We searched the catalogues of these two series and located complete shareholder returns for 11 breweries and 18 brewery-years.[42] Because we are interested in control or voting rights, we obtained data on each brewery's voting scales for their preference and ordinary shares from their articles of association, *Burdett's Official Intelligence* (*BOI*) and *SEOI*. Furthermore, because the shareholder returns do not report the brewery's directors, we found the names of directors for the relevant years from articles of association, *BOI*, *SEOI*, and *Stock Exchange Year-book* (*SEY*).

Table 3 details the capitalisation and ownership structure of the 11 breweries for which we were able to locate ownership data. This cannot be viewed as a representative sample because it only consists of breweries for which we were able to locate ownership records. Nevertheless, we have four breweries with several years of data, which enables us to see how ownership changes over time. We also have breweries which incorporated before the two brewery booms as well as breweries which incorporated during those booms.

<<INSERT Table 3>>

As can be seen from Table 3, Barretts, which was a London-based brewery incorporated during the first brewery boom, had a broad shareholder base and preferred to raise its capital from shareholders rather than debenture-holders. Notably, between its 1891 and 1900 censuses, its ownership became more dispersed, with directors' holdings falling from 12.3 to 2.5 per cent of votes by 1900.

The next brewery in Table 3, Campbell Johnstone and Company, was a London-based brewery which had incorporated in 1896. The capital structure of this brewery was typical of breweries which incorporated during the boom of the 1890s, with circa 40 per cent coming from debentures, 30 per cent from ordinaries, and 30 per cent from preference shares. The ownership structure was also common since one consortium of five individuals jointly owned 13,400 of the firm's 14,000 ordinary shares, with the result that the largest five owners controlled 100 per cent of the voting stock. Notably, the two directors (John Campbell Johnstone and William Seymour) were not members of this consortium and neither were their family members.

The Edinburgh Brewery had a typical capital structure, buts its shares were relatively widely dispersed as indicated by the Herfindahl index and the votes controlled by the largest 10 owners. Unlike other breweries established in this era, this company was set up to

purchase and amalgamate several small Scottish breweries, which explains why its ownership structure was not concentrated.

The Lion Brewery was a London-based brewery, which was one of the first breweries to incorporate in the UK. What is interesting about this brewery is that its capital structure changed over time such that nearly 50 per cent of its capital in 1901 was made up of debentures. Furthermore, we also see that its ownership was relatively diffuse from its inception and became more diffuse over time.

Michell and Aldous, based in the Kilburn district of London, was a brewery which incorporated and came to the market to raise debenture finance. It only had 26 shareholders and, as can be seen from Table 3, five of those controlled 99.7 per cent of the votes. Morgans' Brewery, a Norwich-based company, had 214 shareholders in 1890, but the directors, chiefly members of the Morgan family, controlled 89.7 per cent of the voting rights by holding the bulk of the ordinary shares.

Similar to the Lion Brewery, the New Westminster Brewery was an early incorporator, but unlike the Lion Brewery, it was financially conservative and did not raise much in the way of debt finance. Instead, it issued ordinary and preference shares to fund its expansion in the 1890s, and as a result, its ownership became more dispersed, with the result that by 1899, the directors only controlled 6.1 per cent of the voting rights.

Smith, Garrett and Company was a London-based brewer, which was an early incorporator. However, it was a family brewery with two Garretts serving as the managing directors and a Smith serving as Chairman in 1897. Despite raising finance from 236 shareholders, the directors controlled 24.5 per cent of the voting rights in 1897 and the five largest shareholders (which included three Garretts and one Smith) controlled 41.7 per cent. Like many of its peers in the 1890s, 40 per cent of this brewery's capital came from debentures.

The final three breweries in Table 3, Style and Winch, Tadcaster Tower, and Wenlock, which were located in Kent, Yorkshire, and London respectively, have similar capital structures in that they were highly leveraged – 41, 55 and 57 per cent respectively. In addition, all three had a small number of shareholders and highly concentrated ownership.

In summary, the breweries in Table 3 suggest the following typography: (a) breweries which were closely held and 40 per cent or more of their capital structure was debt; (b) breweries which had relatively diffuse ownership and very little in the way of debenture finance; and (c) breweries with relatively diffuse ownership and which had a capital structure consisting of circa 40 per cent debentures. Without concrete data, it is difficult to say how many of the 308 breweries in 1900 fell into each of these categories, but given that a minority had their ordinary and preference shares listed in the *IMM*, it is likely that (a) was the most common.

5. Returns on brewery securities

Having documented the expansion of the British brewing industry and the means by which capital was raised, we now ask how investors in brewery securities fared during this era? To answer this question, we examine the returns on portfolios of brewery securities; we consider ordinaries, preference shares and debentures as separate portfolios. We then use end-of-year brewery security prices reported in the *IMM* to calculate annual capital appreciation, and collect data on dividends and debenture coupons to enable us to calculate total annual returns for each class of security.[43] When calculating the capital appreciation and total return for the brewery sector, we use unweighted log returns and log returns which are weighted using the paid-up capital of the individual security issue. As some breweries may have left the *IMM* because of liquidation, we track down the reasons why a brewery's securities were delisted and adjust the delisting return where appropriate, using the *Register of Defunct Companies*.

The returns on brewery securities are then adjusted to take account of the delisting return. The returns are also adjusted to take account of recapitalisations, where share capital was reduced e.g., Watney Combe Reid and Co. in 1906.[44]

Figures 5 and 6 show indices of annual total returns and capital appreciation, with the index value in 1878 being set equal to one. If an investor had held a weighted portfolio of brewery ordinary shares from 1878 to 1913, the total return they would have earned would have narrowly underperformed the overall market. However, the weighted total returns are being driven by Guinness, the largest and most successful brewery of the era; when Guinness is excluded, the terminal point of the index of ordinary brewery shares is 1.59 rather than 4.36. The performance of the breweries relative to the market was poor given the greater riskiness of brewery ordinary shares as manifested in higher standard deviations of returns on brewery ordinary shares than on the market (see Table 4). Notably, the equally-weighted (or unweighted) total returns in Figure 5 reveal that the overall market outperformed the brewery sector and, as can be seen from the standard deviations in Table 4, was also less risky.

<<INSERT Figures 5 and 6 and TABLE 4>>

Figure 5 reveals that there was a boom in ordinary shares from about 1893 onwards and to a lesser extent there was a boom in preference shares. This boom was driven by high dividends and capital gains (Figure 6). However, the boom peaked in 1899, and thereafter, the indices of total returns fell until 1909. This fall was due to a combination of missed or cut dividends and a fall in brewery share prices. As can be seen from Figure 5, both ordinary and preference shares staged something of a recovery after this.

Debenture returns revealed few signs of a large boom and bust in the debenture market. Nevertheless, there was an increase in the index of debenture returns during the 1893-98 period, which levels off thereafter. Notably, the 1893-98 period is associated with

very low interest rates, with the Bank Rate averaging 3.0 per cent, compared to 4.3 per cent for the period 1878-1892 and 4.5 per cent for the period 1899-1913.[45]

The indices of capital gains in Figure 6 reveal the extent to which ordinary and preference shares lost value in the decade after 1899. The terminal value of the indices was even lower still whenever Guinness was excluded. Notably, debentures also fell in value, but not by as much as equities.

Table 4 compares the returns on breweries in the 1886-99 period (the happy hour) to the 1900-10 period (the hangover). The main observation regarding the first period is that all securities, particularly ordinaries, earned a high return compared to the overall equity and debenture markets. As can be seen from Table 4, in the case of ordinary shares, most of this return came from dividend income rather than capital gains. The main observation regarding the second period is that ordinary shares, preference shares and debentures all suffer capital losses throughout the period, with the annual capital loss on the weighted portfolio of ordinary shares averaging 15.31 per cent. Such is the scale of the capital losses that when we look at weighted total returns, even debentures earned a small negative return over the 1900-10 period. As can be seen from Table 4, this was not reflected in the wider equity and debenture markets.

6. The hangover: explaining post-1900 performance

Why did the market for brewery securities perform so poorly in the 1900s? One reason for the poor performance was the ruinous scramble for property during the 1894-99 boom. Breweries had overpaid for public houses and had large interest commitments on their debt, which ate into their profits.[46] However, in the 1900s, the industry was also hit by problems in the wider economy and by government taxation and regulation. Unsurprisingly, the directors

of the breweries highlighted these issues as reasons for poor performance rather than the debt-financed expansion they had engaged in during the good times.[47]

Beer consumption fell every year from 1899 to 1909 and by close to 14 per cent over the decade.[48] This largely reflected pressures on working-class standards of living as well as a decline in the popularity of public houses due to the rise of alternative sources of working-class entertainment. In addition, the development of tram networks resulted in a growth of suburbs and a concomitant decline in use of central London pubs. Notably, when the standard of living improved for the working classes after 1909, there was a revival in beer consumption, with consumption increasing by the not insubstantial amount of three million barrels between 1909 and 1913.[49] This increase in consumption is associated with the improvement in the performance of brewery ordinary and preference shares between 1910 and 1913 in Figures 5 and 6.

In 1900 an additional one shilling of duty was put on each barrel of beer produced by UK breweries to help pay for the Boer War. However, this was not removed when the war was over. Further problems for the brewing industry came when the temperance movement was given a fillip by the re-election of a Liberal government in early 1906. A new Licensing Bill was introduced in 1907, which "shook the brewing industry to its foundations".[50] Amongst other things, the Bill proposed to reduce further the number of on-licenses and to increase their price by requiring that the holder of the license pay its monopoly value. Notably, the unweighted capital losses on ordinary brewery shares, preference shares and debentures in 1907 were the worst of the entire 1900-10 period, reflecting the threat of this Bill to the brewing industry. The Bill, however, was defeated by the House of Lords in November 1908. Subsequently, in the famous People's Budget of 1909, it was proposed to increase substantially duties on breweries and public houses, which would have particularly affected those breweries with a large tied trade.[51] However, this too was rejected by the

Lords, resulting in a constitutional crisis and a general election. Subsequently, the new Licensing Act of 1910 did not contain the harmful clauses proposed in the 1907 Bill and the Budget duties imposed on breweries were not as large as brewers feared. Furthermore, the temperance movement had run its course, which was another fillip to the performance of brewery securities after 1910.

These factors highlight the political risks affecting the brewery sector in this period, which may explain some of the 'hangover'. However, they cannot explain the variation within the brewery industry. Not every brewery had the same experience post-1900 – some, such as Guinness, performed respectably whilst others, such as Allsopp's, Watney Combe and Reid, and Ind, Coope struggled. In this section, we test various hypotheses which attempt to explain the variation in performance after 1900. One possible explanatory factor for post-1900 performance could be the amount of debt accumulated by breweries during the brewery wars. It has been suggested in the literature that those breweries which issued debentures against overvalued assets in the 1890s suffered the most in the 1900s.[52] London breweries in particular had expanded rapidly using debt finance to acquire very expensive on-licenses.[53]

Another possible explanatory factor is the familial structure of brewery ownership. According to Payne, family ownership negatively affected brewery performance after 1900 and Chandler highlights the UK breweries as a prime example of the type of personal ownership which was detrimental to firm performance.[54]

Good corporate governance may also explain the variation in post-1900 performance. For example, Gourvish and Wilson argue that good management and conservative financial decision-making explains the variation in post-1900 profit performance.[55] Concomitantly, the size, composition and incentives of the board of directors may have played a role in the performance of companies in the Victorian and Edwardian eras.[56] First, although a contemporary legal expert suggested that 'it is not generally desirable to have a large

board'[57], possibly because they resulted in free-riding[58], Campbell and Turner argue that large boards are associated with superior performance for Victorian companies in general.[59] Large boards of directors can partially constrain executive directors by making collusion amongst them more costly and they also engage in mutual monitoring of one another.[60] Second, directors in Victorian Britain usually had to own a certain number of shares before they qualified as directors, which may have incentivised them to be better managers or monitors of managers.[61] Third, having politicians and peers on boards in this era was commonplace. Contemporaries viewed such directors as ornamental, being 'more frequently incumbrances than aids'.[62] Although having politicians on the board may have helped some companies, having members of the ruling class in general as board members was associated with inferior performance.[63] Nevertheless, given that the brewing industry was politically contentious, having peers and MPs on the board may have been beneficial to breweries.

As well as testing the hypotheses suggested by the historiography of the brewing industry, we also want to test two other hypotheses. First, we want to see if breweries with greater access to credit in 1900, as proxied by multiple bank relationships, were associated with worse performance in the 1900s.[64] Second, given the importance of the capital markets in disciplining companies in this era, we want to see whether having its securities listed on more than one stock exchange in 1900 resulted in better performance in the 1900s.[65]

We have two dependent variables: (a) the percentage change in the price of ordinary shares between 1900 and 1909 and (b) the percentage change in the price of preference shares between 1900 and 1909. The data for these variables comes from the *IMM*.

In terms of our independent variables, we use the ratio of the book value of debentures and mortgages to total equity in 1900 to measure the extent to which breweries had expanded using debt finance during the preceding boom. In addition, as London breweries were at the centre of this boom, we create a binary variable which equals one if a

brewery's head office in 1900 was in London, zero otherwise. We also consider how the number of years since a brewery's incorporation varies with its performance because later incorporators may have been more likely to have been caught up in the scramble for property.

As detailed ownership records have not survived for the vast majority of breweries, we use a proxy to measure whether or not a brewery is family controlled. We create a binary variable which equals one if the company's name contains the surname of one or more of the directors in 1900 or if two or more directors share the same surname in 1900, zero otherwise.

One potential weakness with this measure of family control is that the name of the brewery may no longer contain the family name of the founding brewers, but the founding brewer or a family member is on the board of directors. For example, the Bristol United Breweries Ltd was formed to acquire eight family breweries and some of these family names may be on the board of the amalgamated brewery. Thankfully, the *Stock Exchange Official Intelligence* gives a very detailed history of the origins and founding families of each brewery company so that we can be confident that we are accurately capturing whether or not a brewery was family controlled.

Another potential weakness with our measure is that it does not pick up the extent of family control. For example, the brewery name may contain a director's surname, but that director may play a limited governance role and may be there simply for strategic or ornamental reasons. We suspect that this is unlikely for the majority of our 72 family breweries. First, 52 of these 72 breweries had directors with the same surname on the board, and the average number of directors with the same surname was over three. Second, 10 of the remaining 20 'family' breweries did not have their common equity traded on public markets, which suggests close control being exercised by the founding brewer and other directors.

In terms of governance independent variables, we create three variables for 1900 which proxy the quality of governance: board size, director share qualifications, and the

percentage of peers and MPs on the board of directors.[66] Our variable which attempts to measure a brewery's access to finance is a binary variable which equals one if a brewery has a relationship with more than one bank in 1900, zero otherwise. We also use an alternative measure to proxy access to credit, which is a binary measure which equals one if a brewery has a relationship with one of the big eight banks in 1900.[67] Our variable which measures capital-market discipline is a binary variable which equals one if a brewery's securities trade on more than one stock market.[68]

We also include brewery size as a control variable in our regressions. We measure it by using the natural logarithm of the book value of total debt and equity capital. In our regression where the percentage change in the price of preference shares is our dependent variable, we control for whether or not preference shares had the same voting rights as ordinary shareholders by including a binary variable which equals one if preference shares have the same voting rights as ordinary shares, zero otherwise.

Appendix Table 1 details the definitions and sources for our variables and Table 5 contains the summary statistics of our variables. From these summary statistics, we see that the average change of ordinary share prices was -54.16 per cent, whilst that of preference shares was -37.93 per cent. In terms of our main independent variables, we note the following: (a) the average brewery was highly leveraged; (b) the majority of breweries were family-controlled; (c) the average board size was just below 5.3; (d) the average of the *PeersMPsonBoard* variable suggest that most boards did not have peers or MPs on them; (e) over 20 per cent of the sample were breweries with London headquarters; (f) 24 per cent (Panel A) and 19 per cent (Panel B) of breweries had multiple bank relationships; and (g) 37 per cent (Panel A) and 52 per cent (Panel B) were traded on more than one stock market.

<<INSERT Table 5>>

We regress our independent variables on our two measures of performance using OLS to see whether there is a relationship between the covariates and our performance measures. Reverse causality is a minor issue given our empirical design, with the performance variables being measured after and not before or co-jointly with the independent variables. The regression results are in Table 6.

<<INSERT Table 6>>

The first thing which we note from specifications 1 and 2 in Table 6 is that the leverage measures are not statistically significant, suggesting that the amount of debt which a brewery accumulated up to 1900 is not correlated with its post-1900 performance. Notably, in specification 1 the coefficient on the *LondonHQ* variable suggests that London-based breweries performed better than their non-London counterparts, which is contrary to the view that London breweries suffered the most when the boom ended. In addition, the negative and statistically significant coefficient on the *Age* variable suggests, contrary to expectations, that more recently incorporated breweries actually performed better than breweries incorporated earlier in the century. However, the *LondonHQ and Age* variables fall just outside the 10 per cent level of significance in specification 2.

The coefficient on the *FamilyFirm* variable is statistically not different from zero. These results imply that the ordinary shares of family-controlled breweries performed no worse or better than their peers in the post-1900 period.

In terms of our governance variables, the coefficients on the *Boardsize* and *DirectorQual* variables imply that board size and director share qualifications were uncorrelated with post-1900 performance. However, the positive and significant coefficient on the *PeersMPonboard* variable suggest that having a peer or MP on the board was correlated with better post-1900 performance. Therefore, brewing was one industry where having members of the ruling class on the board had positive benefits. However, this result

no longer holds whenever we omit Guinness, which had several peers on its board, from the sample.

In terms of our access to finance variable, the coefficient on the *MultipleBanks* variable is negative and statistically significant in specification 2, suggesting that access to credit is negatively correlated with post-1900 performance, although this variable is marginally insignificant in specification 1. On the other hand, our variable which proxies the level of capital-market discipline, *MultipleStockMarkets*, has a positive and statistically significant coefficient in both specifications 1 and 2, suggesting that the number of markets a brewery's securities were traded on was correlated with better post-1900 performance.[69] The coefficient on the *LnSize* variable suggests that larger breweries performed worse than smaller ones in the post-1900 period. It is entirely possible that larger breweries had grown too much, making them more complex institutions to manage in the post-1900 period. Alternatively, Knox suggests that the larger breweries had been more aggressive in securing tied houses during the brewery wars.[70]

Specifications 3 and 4 in Table 6 contain the results for the regressions where the performance of preference shares in the post-1900 period is the dependent variable. These results largely concur with those in specifications 1 and 2 with several exceptions. First and foremost, the coefficient on *FamilyFirm* suggests that the preferences shares of family-controlled breweries performed worse than those of others, possibly because the majority of preference shares were not owned by family members. Second, the coefficient on *LondonHQ* suggests that the preference shares of London-based breweries performed no worse or better than those of non-London breweries. Third, unlike with the performance of ordinary shares, larger boards are correlated with better performance of preference shares. This perhaps suggests that larger boards were better at protecting the interests of preference shareholders than ordinary shareholders. Fourth, having securities listed on multiple markets appears to be

uncorrelated with the post-1900 performance of preference shares. One possible explanation for this finding is that capital-market discipline was only relevant for ordinary shares. Fifth, the *MultipleBanks* variable is insignificant, as was the case with regression specification 1 in Table 6. However, whenever we include the *Big8Bank* variable, we find a negative and significant coefficient, implying that the preference shares of breweries which had a relationship with a large bank performed worse in the post-1900 than their peers. This implies that access to credit in 1900 may have resulted in breweries over-extending themselves at the expense of their preference shareholders.

8. Conclusions

The brewing industry enjoyed a 'happy hour' in the last 15 years of the nineteenth century, with a 25-fold increase in brewery listings and an 82-fold increase in brewery capitalisation. However, this expansion did not necessarily mean that original brewery owners relinquished much in the way of control because of the popularity of debentures. About two-thirds of the 308 breweries listed in 1900 were closely-held companies, whose only major security being traded on public markets was debentures. During this boom, brewery ordinary and preference shares and debentures reaped high annual returns. After the 'happy hour' came the inevitable 'hangover', which lasted for the first decade of the twentieth century, with huge capital losses on brewery securities. Why did the boom and bust in brewery securities happen? Why did investors and brewers not foresee the long-term consequences of the scramble for property on profitability and dividends? What was the effect of the two brewing booms on other new industries which came to the capital market at the same time? Did they help stimulate promotion / IPO booms in other sectors? Did the large brewing bust make it more costly for other companies which attempted to come to market via an IPO after 1900? Future research

should explore the ultimate reasons for and the wider effects on the capital market of what can only be termed the 'brewery bubble'.

Our study of the financing of the breweries highlighted an important way in which family enterprises at the end of the nineteenth century attempted to maintain control of their businesses whist raising capital. The way that they did so was to issue debentures and preference shares which did not dilute their voting rights. However, the losses suffered by investors and the capital restructuring of several major breweries may have helped change the perception of investors and capital raisers alike as to the risks inherent in issuing debenture and preference shares. Indeed, the experience of the breweries may have made it more difficult for future capitalists to raise capital via debt and preference shares whilst keeping the ordinary capital closely held. This is an avenue of future research which needs to be explored by business historians.

Why did brewery securities fall so much in value after 1900? We suggest that the poor post-1900 performance was largely due to the brewery wars which had resulted in breweries overextending themselves and grossly overpaying for public houses. Wider economic and political conditions, however, did not help matters. During the hangover decade, some breweries performed better than others. We find that indebtedness is not a covariate of post-1900 performance, whereas good corporate governance and capital market discipline have a positive relationship with performance, and family ownership has a negative relationship with the performance of preference shares. These findings do not imply causality and they may ultimately be pointing to different strategies adopted by breweries with different governance mechanisms. This raises the question as to whether family breweries were managed in a different manner than non-family breweries.

It appears that many breweries were the typical Chandlerian firm in that they were family controlled and performed poorly. Indeed, the evidence in this paper implies that the

ways in which breweries owners attempted to raise capital for expansion without handing over control exacerbated the bust experienced by the industry in the early 1900s and may actually have sped up the move towards managerial capitalism in this and other sectors.

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Table 1. *Capitalisation of domestic brewing companies in United Kingdom, 1885-1913*

	1885	1890	1900	1913
No. of companies	12	85	308	366
Total Debt (£ `000s)	162.55	12,683.32	66,605.26	90,705.64
Total Equity (£ `000s)	1,945.43	32,753.03	98,869.96	103,717.49
Ordinary shares (£ `000s)				
Mean	127.12	220.41	166.56	148.85
Median	88.18	95.25	75.00	70.00
Standard deviation	145.64	371.79	443.91	367.33
Preference shares (£ `000s)				
Mean	35.00	164.92	154.45	134.53
Median	0.00	65.00	75.00	70.00
Standard deviation	60.83	313.95	287.93	246.43
Total Equity (£ `000s)				
Mean	162.12	385.33	321.01	283.38
Median	88.18	158.42	149.84	130.44
Standard deviation	197.25	675.29	696.17	587.19
Total Debt (£ `000s)				
Mean	13.55	149.22	216.25	247.83
Median	0.00	45.00	112.00	124.32
Standard deviation	29.09	291.28	436.48	467.96
Preference / ordinary ratio				
Mean	0.16	0.76	1.11	2.96
Median	0.00	0.84	1.00	1.00
Standard deviation	0.32	0.61	0.81	26.83
Debt / equity ratio				
Mean	0.20	0.43	0.86	1.06
Median	0.00	0.45	0.80	0.93
Standard deviation	0.47	0.38	0.83	0.84

Source: Authors' calculations based on data reported in *Burdett's Official Intelligence* (1885 and 1890), the *Stock Exchange Official Intelligence* (1900) and the *Stock Exchange Yearbook* (1913).

Notes: These figures exclude foreign breweries which were incorporated in the UK. Although the majority of debt was in the form of debentures, mortgages have also been included in the debt figures above. Deferred ordinary shares are treated as ordinary shares and founders' shares, which only two breweries had, are also treated as ordinary shares for the sake of the analysis above. The debt / equity ratio is total debt divided by ordinary and preference equity capital.

Table 2. *Preference share voting regimes in 1900: difference-in-means tests*

	Preference Rights = Ordinary Rights	Preference Rights < Ordinary Rights
PANEL A		
Total Capitalisation (£'000s)		
Mean	411.934	869.692
P(Z<=z)	*0.007*	
Age		
Mean	7.467	6.028
P(Z<=z)	*0.015*	
Leverage		
Mean	0.805	0.807
P(Z<=z)	*0.974*	
N	153	107
PANEL B		
Family breweries	103	83
Non-family breweries	49	22
N	152	105

Source: Authors' calculations based on data reported in Stock Exchange Official Intelligence (1900).
Notes: Age is the number of years from incorporation to 1900; Leverage is the book value of debt over the book value of total equity. A family brewery is defined as such if the brewery's name contains the surname of one or more directors or if multiple directors share the same surname.

Table 3. *Ownership structure of various breweries, 1871-1901*

	Est.	Ownership census	Debentures & mortgages (£'000)	Ordinary shares (paid up) (£'000)	Preference shares (paid up) (£'000)	No. shareholders	Vote largest owner (%)	Vote largest five owners (%)	Vote largest ten owners (%)	Vote directors (%)	Votes Herfindahl index (%)
Barretts	1886	1891	16.6	125.0	125.0	914	10.3	21.9	27.2	12.3	1.7
Barretts	1886	1900	25.0	124.7	125.0	1,022	2.9	9.7	15.6	2.5	0.5
Campbell Johnstone & Co.	1896	1901	100.0	70.0	70.0	177	95.7	100.0	100.0	2.9	91.7
Edinburgh United	1889	1890	200.0	82.5	83.0	368	4.4	15.8	25.1	17.9	1.1
Edinburgh United	1889	1900	200.0	109.8	110.0	650	14.3	25.4	33.3	n/a	2.7
Lion Brewery Co.	1865	1866	n/a	60.0	25.0	291	8.3	20.0	29.9	n/a	1.7
Lion Brewery Co.	1865	1871	n/a	207.0	100.0	315	5.5	21.5	32.3	n/a	1.7
Lion Brewery Co.	1865	1891	200.0	281.8	171.0	603	4.5	16.8	25.3	7.9	1.0
Lion Brewery Co.	1865	1901	400.0	237.1	181.0	756	3.7	13.3	20.5	4.7	0.7
Michell & Aldous	1894	1899	77.0	62.5	54.0	26	46.6	99.7	100.0	99.2	42.2
Morgans' Brewery	1887	1890	62.8	100.0	83.0	214	33.2	94.7	100.0	89.7	23.1
New Westminster Brewery	1873	1884	17.6	100.0	20.0	265	4.3	21.7	36.7	17.1	2.0
New Westminster Brewery	1873	1889	30.4	109.9	30.0	334	3.8	18.4	31.2	7.1	1.5
New Westminster Brewery	1873	1899	4.6	199.8	200.0	768	2.2	11.1	21.5	6.1	0.8
Smith, Garrett & Co.	1882	1897	225.0	210.0	150.0	236	20.0	41.7	55.1	24.5	6.1
Style and Winch	1899	1899	425.0	300.0	300.0	14	18.9	75.5	100.0	68.5	14.0
Tadcaster Tower	1894	1901	250.0	100.0	100.0	65	14.8	66.1	94.3	38.8	10.7
Wenlock	1893	1893	50.0	37.4	0.0	42	31.4	83.8	89.4	63.2	21.7

Sources: See text for details on ownership sources; capital and debenture data are from *Stock Exchange Yearbooks*.
Notes: The debenture and capital data refer to the year of the ownership census.

Table 4. *Annual returns on brewery securities, 1886-99 and 1900-10 (%)*

	1886-1899		
	Arithmetic Mean	Geometric Mean	Standard Deviation
Total Return (Unweighted)			
Ordinary Shares	11.21	10.68	11.42
Preference Shares	6.84	6.66	6.38
Debentures	5.33	5.31	2.49
Overall Equity Market	8.59	8.36	7.29
Overall Debenture Market	4.93	4.91	2.39
Total Return (Weighted by paid-up capital)			
Ordinary Shares	12.01	11.33	12.89
Preference Shares	6.73	6.59	5.58
Debentures	4.85	4.83	2.34
Overall Equity Market	3.63	3.47	5.97
Overall Debenture Market	3.94	3.90	2.93
Capital Gains (Unweighted)			
Ordinary Shares	1.97	1.36	11.74
Preference Shares	0.77	0.59	6.33
Debentures	0.76	0.73	2.39
Capital Gains (Weighted by paid-up capital)			
Ordinary Shares	1.90	1.15	12.87
Preference Shares	0.90	0.76	5.39
Debentures	0.41	0.38	2.24

	1900-1910		
	Arithmetic Mean	Geometric Mean	Standard Deviation
Total Return (Unweighted)			
Ordinary Shares	-4.90	-5.06	5.75
Preference Shares	-3.28	-3.38	4.50
Debentures	0.19	0.16	2.31
Equity Market	5.93	5.87	3.78
Debenture Market	2.21	2.20	1.64
Total Return (Weighted by paid-up capital)			
Ordinary Shares	-7.65	-8.02	8.64
Preference Shares	-3.95	-4.08	5.06
Debentures	-0.14	-0.17	2.56
Equity Market	5.25	4.94	8.49
Debenture Market	1.75	1.74	1.59
Capital Gains (Unweighted)			
Ordinary Shares	-13.05	-13.20	5.34
Preference Shares	-8.33	-8.42	4.36
Debentures	-4.01	-4.04	2.31
Capital Gains (Weighted by paid-up capital)			
Ordinary Shares	-15.81	-16.28	9.24
Preference Shares	-8.66	-8.79	4.94
Debentures	-4.17	-4.20	2.56

Source: Authors' calculations based on data from *Investor's Monthly Manual*. Overall equity market returns are from Grossman, "New Indices" and overall debenture market returns are from Coyle and Turner, "Law, Politics and Financial Development."

Notes: The above returns have been adjusted for companies which delisted from the market due to liquidation. This information was obtained from the *Register of Defunct Companies*. If no information is given as to the delisting return in this source, then we assume a -100 per cent delisting return.

Table 5. *Summary statistics of regression variables*

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Dependent variables					
OrdCapitalChange (%)	52	-54.16	26.9	-97.83	5
PrefCapitalChange (%)	87	-37.93	23.74	-98.59	40
Independent variables					
PANEL A					
Age (years)	97	8.87	6.08	1	35
Big8Bank	97	0.49	0.5	0	1
Boardsize	97	5.28	1.89	2	13
Debt/Total Equity	97	0.75	0.45	0	2.50
DirectorQual (£)	97	1,761.86	2,789.52	0	20,000
FamilyFirm	97	0.74	0.44	0	1
LnSize	97	6.47	0.91	5.01	9.60
LondonHQ	97	0.24	0.43	0	1
MultipleBanks	97	0.24	0.43	0	1
MultipleStockMarkets	97	0.37	0.49	0	1
NumBanks	97	1.28	0.54	1	3
PeersMPsonBoard	97	0.16	0.62	0	5
PrefShareVote	97	0.69	0.46	0	1
PANEL B					
Age (years)	52	11.29	6.73	1	35
Big8Bank	52	0.50	0.50	0	1
Boardsize	52	5.29	1.73	2	13
Debt/Total Equity	52	0.80	0.42	0	1.82
DirectorQual (£)	52	1,004.81	1,200.42	200	8,000
FamilyFirm	52	0.60	0.50	0	1
LnSize	52	6.35	0.89	5.01	9.60
LondonHQ	52	0.21	0.41	0	1
MultipleBanks	52	0.19	0.40	0	1
MultipleStockMarkets	52	0.52	0.50	0	1
NumBanks	52	1.23	0.51	1	3
PeersMPsonBoard	52	0.21	0.78	0	5
PrefShareVote	52	0.81	0.40	0	1

Notes: The data for the dependent variables is from *Investor's Monthly Manual* and data for independent variables is from *Stock Exchange Official Intelligence*. On several occasions, there was no share price reported for 1909. In those instances, we used the last reported prices in the 1900s. Panel A shows the summary statistics for our full sample. Panel B shows the summary statistics for the 52 breweries for which we have ordinary share price data.

Table 6. *Regression results*

	(1)	(2)	(3)	(4)
Age	-0.011*	-0.008	-0.007	-0.009**
	(0.005)	*(0.005)*	(0.004)	(0.004)
Boardsize	0.032		0.051***	0.046***
	(0.037)		(0.019)	(0.017)
Debt/TotalEquity	0.094		-0.036	
	(0.089)		(0.052)	
DirectorQual	0.000		0.000	
	(0.000)		(0.000)	
FamilyFirm	0.022		-0.122**	-0.099*
	(0.072)		(0.056)	(0.053)
LnSize	-0.169**	-0.161***	-0.114***	-0.126***
	(0.066)	*(0.046)*	(0.043)	(0.036)
LondonHQ	0.176*	0.113	-0.059	
	(0.093)	*(0.087)*	(0.066)	
MultipleStockMarkets	0.153*	0.188**	-0.054	
	(0.080)	*(0.072)*	(0.056)	
MultipleBanks	-0.127	-0.168**	0.047	
	(0.089)	*(0.083)*	(0.053)	
PeersMPsonboard	0.122**	0.128**	0.053	0.070*
	(0.053)	*(0.050)*	(0.042)	(0.037)
Big8Bank			-0.166***	-0.150***
			(0.051)	(0.045)
PrefShareVote			-0.026	
			(0.055)	
Constant	0.342	0.457	0.395	0.409
	(0.344)	(0.290)	(0.237)	(0.191)
N	52	52	87	87
R^2	0.434	0.374	0.358	0.327
Adj R^2	0.300	0.290	0.253	0.277

Notes: *** p<0.01, ** p<0.05, * p<0.1. Standard errors are in parentheses. Tests of the regression residuals confirm normality and homoscedasticity and analysis of variance inflation factors and correlation matrices do not indicate a significant problem with collinearity between variables. The dependent variable in specifications 1 and 2 is the percentage change in ordinary share prices between 1900 and 1909 and in specifications 3 and 4, it is the percentage change in preference share prices between 1900 and 1909.

Appendix Table 1. *Variables: definitions and sources*

Variable	Definition	Data Sources
Dependent variables		
OrdCapitalChange	Percentage change in price of ordinary shares from 1900 to 1909	IMM
PrefCapitalChange	Percentage change in price of preference shares from 1900 to 1909	IMM
Independent variables		
Age	Years since incorporation	SEOI
Big8Bank	A binary variable which equals 1 if company has a relationship with a Big Eight bank (defined as the largest banks by total assets), 0 otherwise	SEOI
Boardsize	The number of directors on the board	SEOI
Debt/Total Equity	Total book value of debenture capital and mortgages / total book value of equity capital	SEOI
DirectorQual	Shareholding requirement for directors	SEOI
FamilyFirm	A binary variable which equals 1 if company's name contains surname of one or more directors or if multiple directors have the same surname, 0 otherwise	SEOI
LnSize	Natural log of par (paid-up) value of total debt and equity	SEOI
LondonHQ	A binary variable which equals 1 if company has a head office in London, 0 otherwise	SEOI
MultipleBanks	A binary variable which equals 1 if company has a relationship with more than one bank, 0 otherwise	SEOI
MultipleStockMarkets	A binary variable which equals 1 if company's securities are traded in more than one stock exchange, 0 otherwise	SEOI, IMM
PeersMPsonBoard	The number of board members who were peers and / or MPs	SEOI
PrefShareVote	A binary variable which equals 1 if preference shareholders have same voting rights as ordinary shareholders, 0 otherwise	SEOI

Notes: Data was obtained from various issues of the Investor's Monthly Manual (IMM) and the Stock Exchange Official Intelligence (SEOI) for 1900.

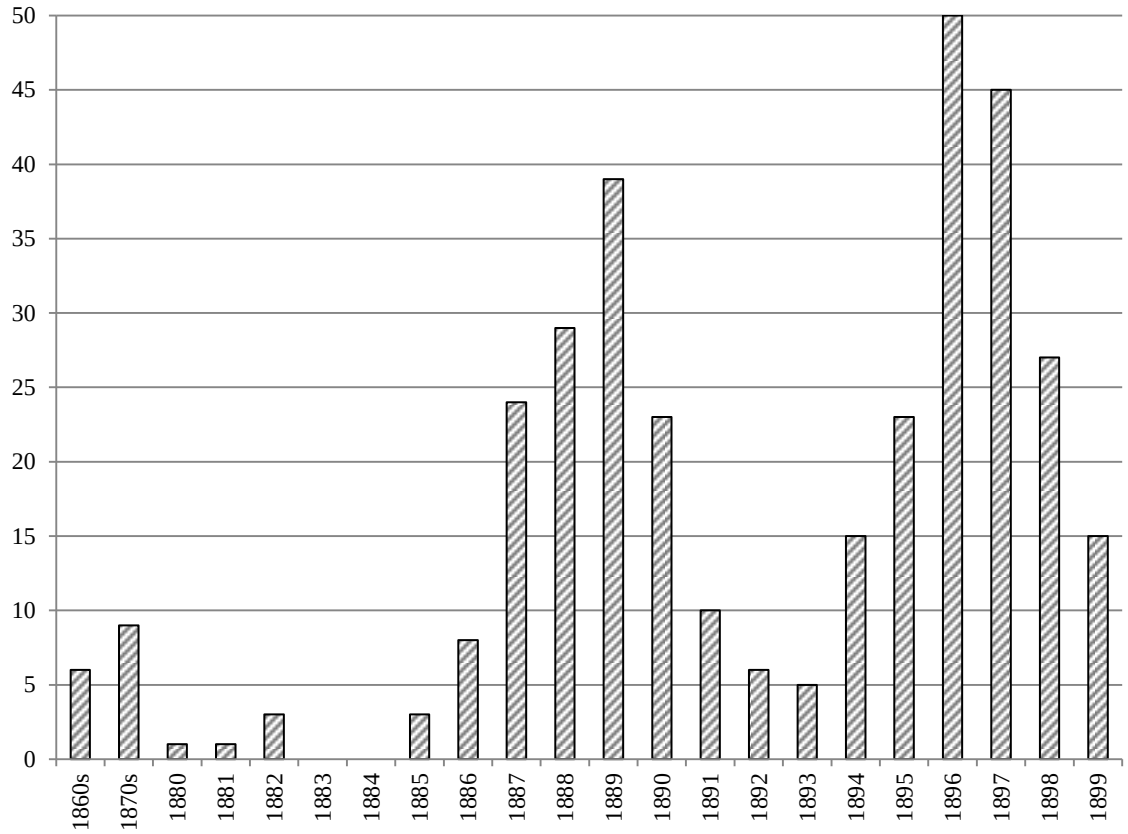


Figure 1. *Domestic brewery incorporations in United Kingdom, 1860s-1899*

Source: Authors' calculations based on incorporation dates reported in *Burdett's Official Intelligence* in 1885 and 1890 and the *Stock Exchange Official Intelligence* in 1900.
Notes: These figures exclude foreign breweries which were incorporated in the UK.

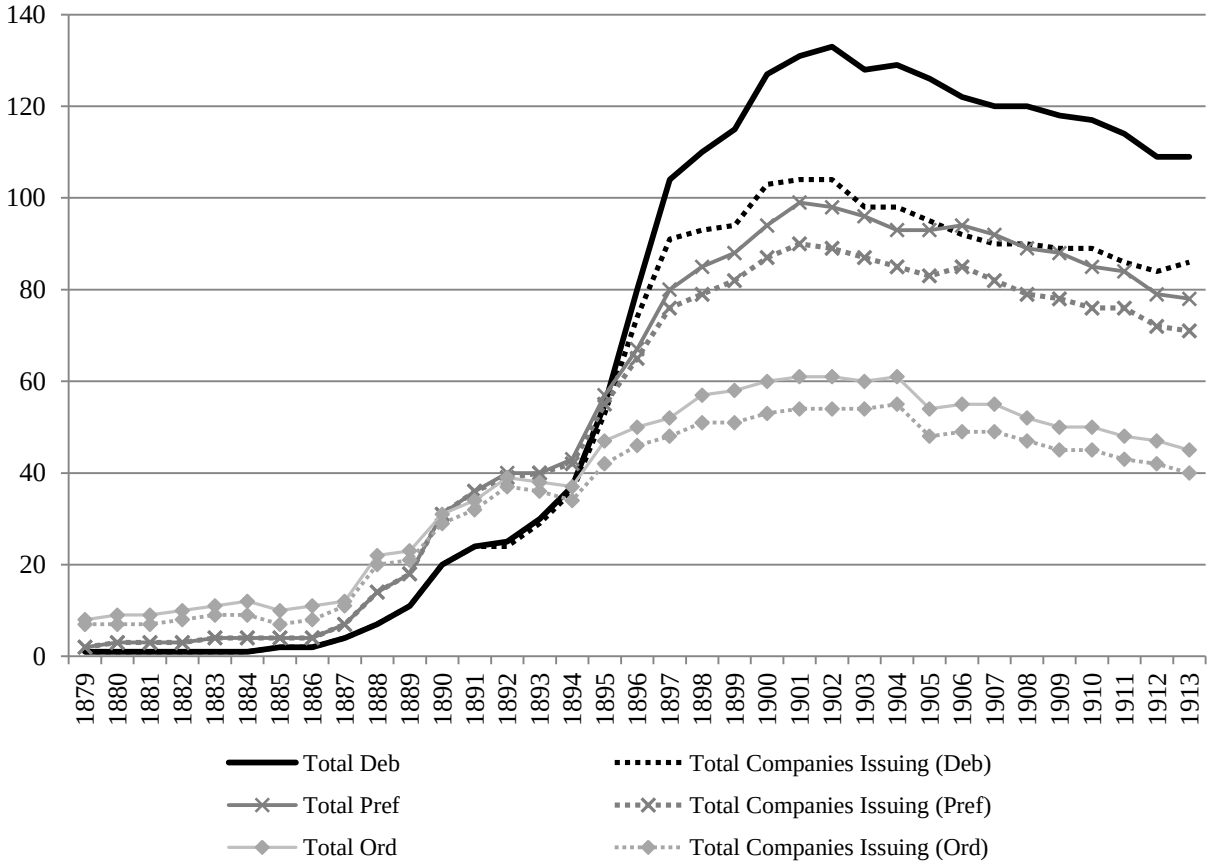


Figure 2. *Number of breweries and brewery securities listed in Investor's Monthly Manual, 1879-1913*

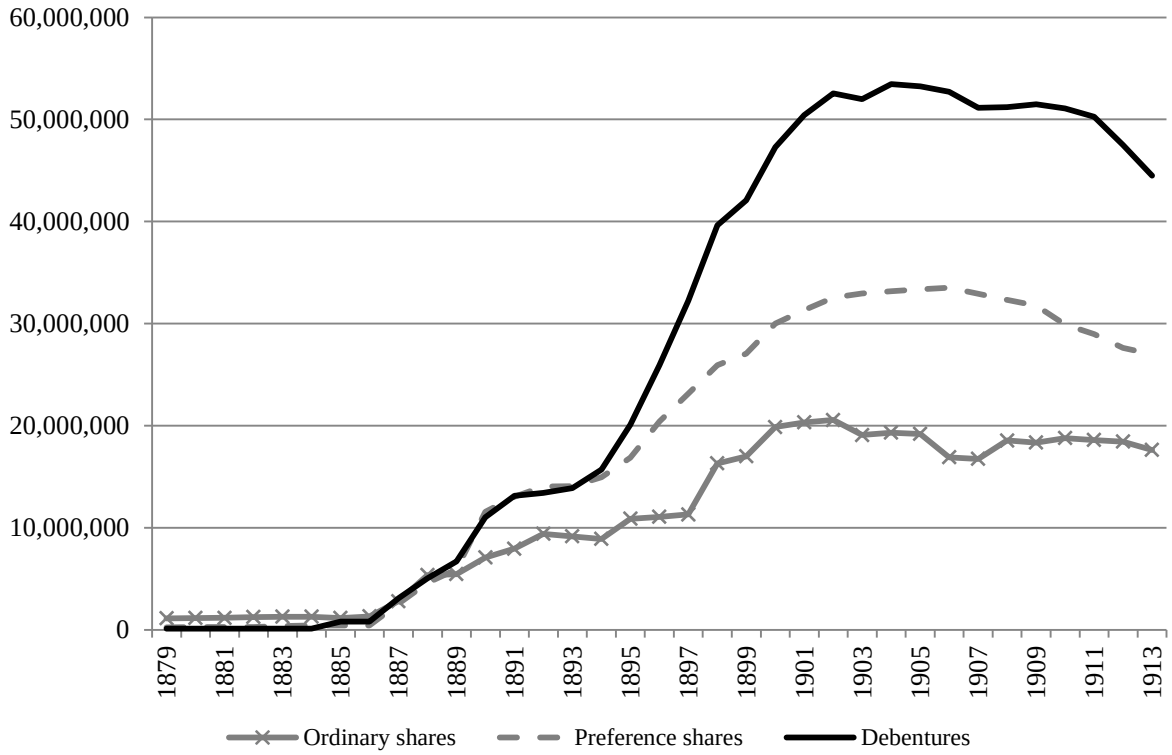


Figure 3. *Paid-up capital of brewery securities quoted in Investor's Monthly Manual, 1879-1913 (£)*

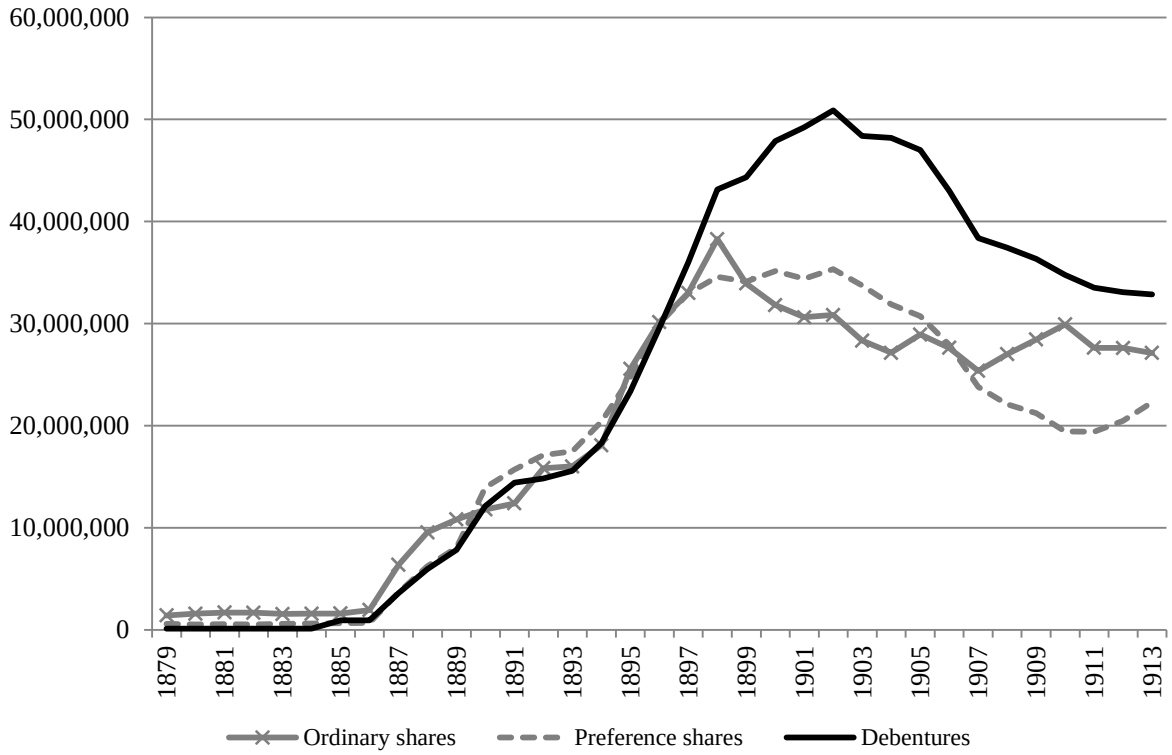
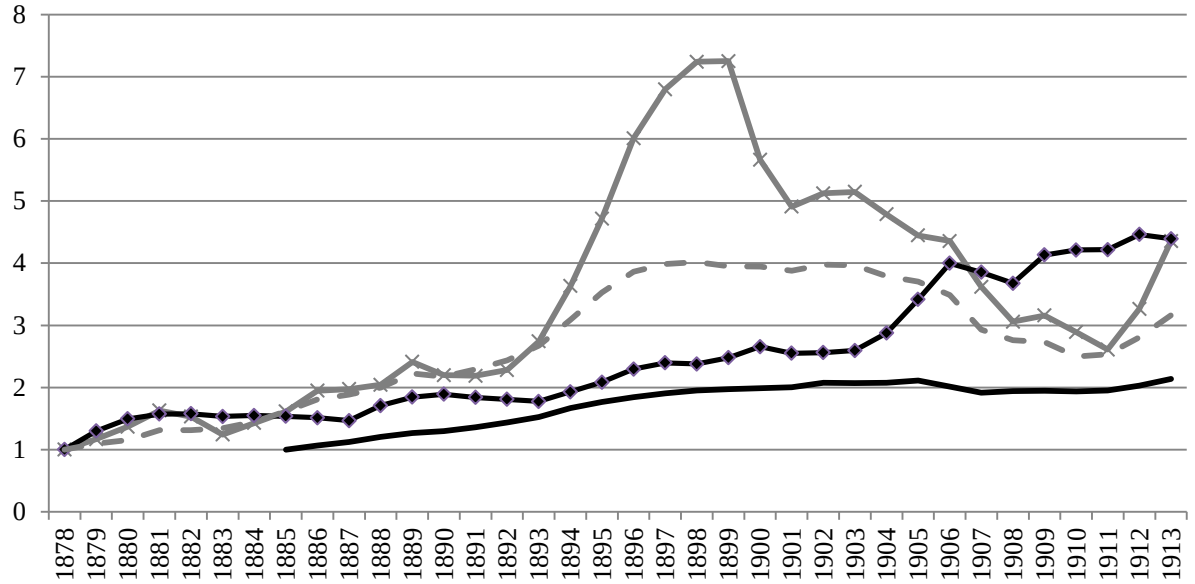


Figure 4. *Market value of brewery securities quoted in Investor's Monthly Manual, 1879-1913 (£)*

Notes: The market value of the debenture issued by Lion Brewery is assumed to be equal to its par value from 1879-1885 as we have no price data for this debenture, which was the only brewery debenture quoted in the *IMM* before 1886.

Panel A: *Paid-up-capital-weighted returns*



Panel B: *Equally-weighted returns*

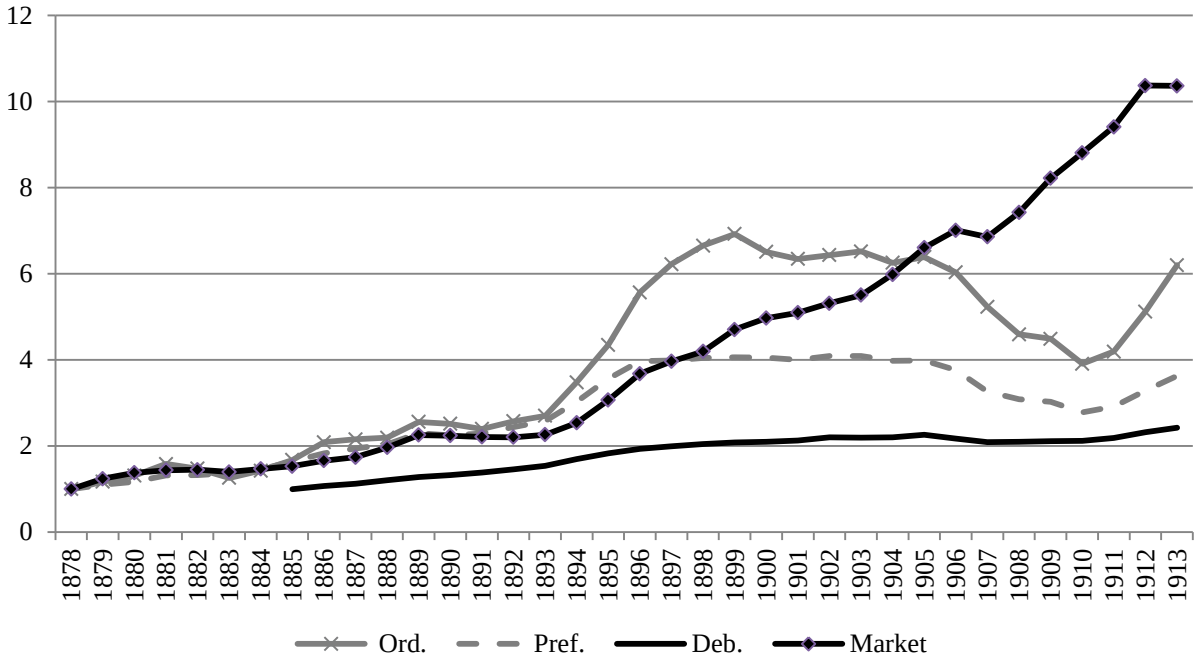
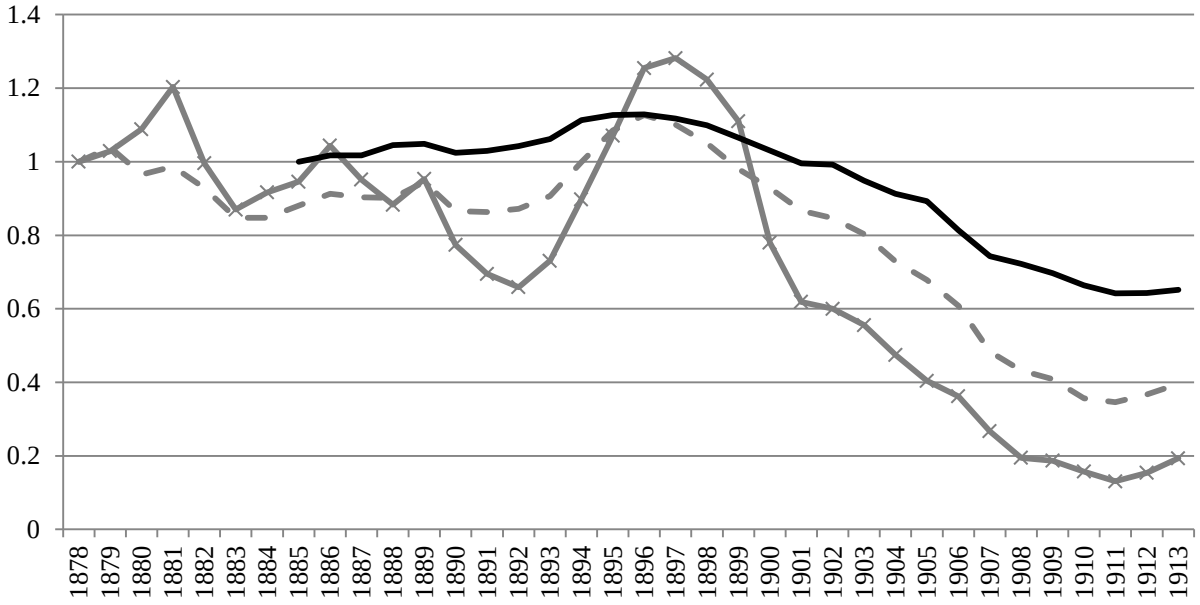


Figure 5. *Total annual returns of brewery ordinary, preference and debenture securities and overall stock-market, 1878-1913*

Source: For brewery securities see text. The overall stock-market returns are from Grossman, 'New indices'.
Notes: The market index and ordinary and preference share indices are set equal to one for 1878. The debenture index begins in 1885 as this is the first year that the IMM contains price information for a brewery debenture. The above indices of returns for brewery securities have been adjusted for companies which delisted from the market due to liquidation. This information was obtained from the *Register of Defunct Companies*. If no information is given as to the delisting return in this source, then we assume a -100 per cent delisting return.

Panel A: *Paid-up-capital-weighted capital appreciation*



Panel B: *Equally-weighted capital appreciation*

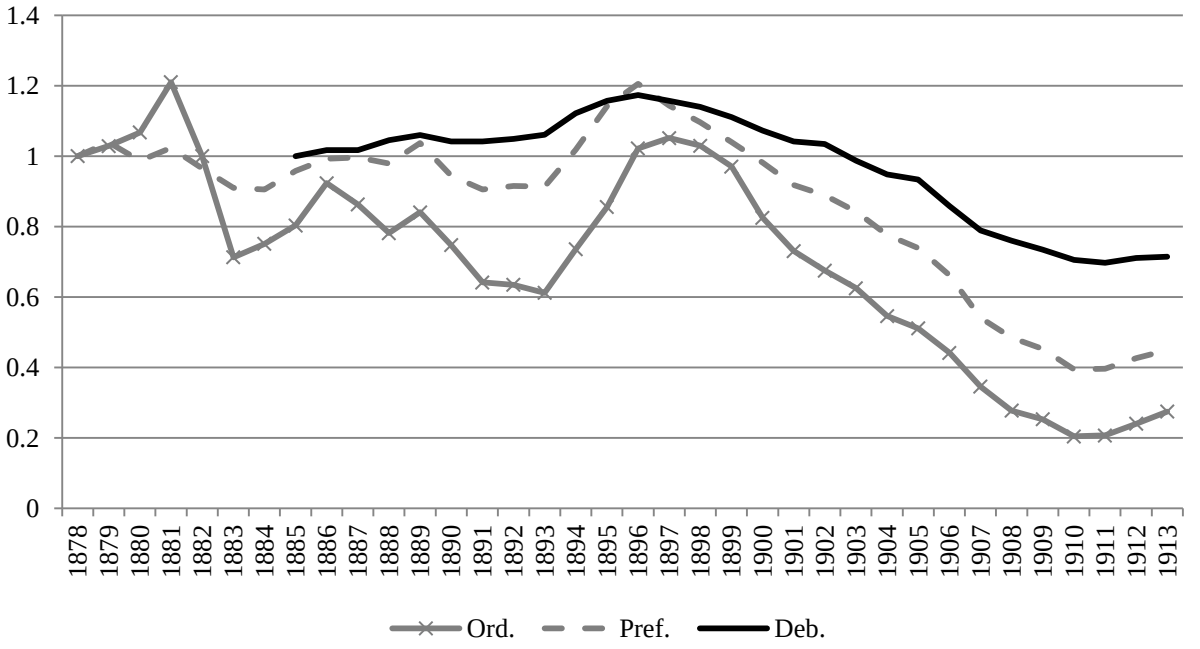


Figure 6. *Total annual capital gain of brewery ordinary, preference and debenture securities, 1878-1913*

Source: See text.
Notes: The ordinary and preference share indices are set equal to one for 1878. The debenture index begins in 1885 as this is the first year that the IMM contains price information for a brewery debenture. The above indices of capital gains for brewery securities have been adjusted for companies which delisted from the market due to liquidation. This information was obtained from the *Register of Defunct Companies*. If no information is given as to the delisting return in this source, then we assume a -100 per cent delisting return.

[1] See Grossman, "New Indices" on the growth of the equity market at this time.

[2] For the historiography of the British brewing industry in this period, see Donnachie, *A History of the Brewing Industry*; Gourvish and Wilson, *The British Brewing Industry*; Gourvish and Wilson, "Profitability"; Janes, *The Red Barrel*; Knox, "The Development of the Tied House"; Vaizey, *The Brewing Industry*. Watson, "Banks and Industrial Finance" in an insightful paper looks at the provision of bank finance to brewers and absolves the banks of failing the brewing industry – the capital market provided the long-term finance which the brewing industry required.

[3] Payne, "The Emergence," 531; Chandler, *Scale and Scope*, 266-7. For the wider debate on family ownership and performance in the business history literature, see, for example, Chandler , *Scale and Scope*; Church, "The Family Firm"; Coli and Rose, "Families and Firms"; Elbaum and Lazonick. "The Decline"; Hannah, "The Divorce of Ownership"; Jones and Rose, "Family Capitalism"; Wilson, *British Business History*.

[4] Jefferys, *Business Organisation*, 268; Cheffins, *Corporate Ownership*, 181.

[5] See Chambers and Dimson, "IPO Underpricing" and Chambers, "Going Public" on the early IPO market in the UK.

[6] Coyle and Turner, "Law, Politics and Financial Development"; Jefferys, *Business Organisation*.

[7] On the role of credit in driving asset-price booms, see Allen and Gale, "Bubbles and Crises"; Kindleberger, *Manias, Panics and Crashes*; Minsky, *Stablizing an Unstable Economy*. On the role of leverage in private equity overvaluation of buyouts, see Axelson et al. "Borrow Cheap".

[8] See Knox, "The Development of the Tied House."

[9] Cheffins, *Corporate Ownership*, 181.

[10] Jefferys, *Business Organisation*, 268.

[11] Wilson, *Practical Hints*, 26 suggests that the extraordinary success of the Guinness flotation raised the demand amongst investors for brewery securities.

[12] See Matthias, "The Brewing Industry" on the rise of the temperance movement from the 1850s onwards. For the later temperance movement, see Gutzke, *Protecting the Pub*; Harrison, *Drink and the Victorians*; and Dingle, *The Campaign for Prohibition*.

[13] Cottrell, *Industrial Finance*, 168-9; Payne, "The Emergence of the Large-Scale Company," 531; Watson, "Banks and Industrial Finance," 63.

[14] On the tied-house system and how it differed from free houses, see Pratt, *The Licensed Trade*, 91-105.

[15] The number of on-licenses in England and Wales fell from 104,792 to 88,445 in 1914, while the population increased by 44 per cent (Vaizey, *The Brewing Industry*, 10).

[16] *Financial Times*, 8 June 1897.

[17] Davis, "Capital Markets," 267.

[18] See Payne, "The Emergence of the Large-Scale Company," 531; *Financial Times*, 15 June 1897, 23 October 1899.

[19] *Financial Times*, 8 June 1897. Unsurprisingly, in this issue, the *Financial Times* argued that "in a mad competition the brewery companies are cutting their own throats".

[20] Watson, "Banks and Industrial Finance," 63.

[21] Cottrell, *Industrial Finance*, 168; Vaizey, *The Brewing Industry*, 6.

[22] Gourvish and Wilson, *The British Brewing Industry*, 257.

[23] Gourvish and Wilson, *The British Brewing Industry*, 257.

[24] Watson, "Banks and Industrial Finance," 64.

[25] According to Grossman, "New Indices," 129, brewing and distilling shares went from constituting 0.97 per cent of total issues on the stock market and 0.41 per cent of total market capitalisation in 1885 to 5.56 per cent and 1.33 per cent in 1891.

[26] According to Grossman, "New Indices," 129, brewing and distilling shares went from constituting 6.15 per cent of total issues on the stock market and 1.35 per cent of total market capitalisation in 1894 to 6.24 per cent and 1.72 per cent in 1900.

[27] Michie, *London Stock Exchange*, 88. This figure is also in line with Grossman's estimate of market capitalisation in 1913.

[28] Regarding preference shares as equity capital is justified because preference, as with ordinary, shareholders were not entitled to their capital back, whereas debt-holders were.

[29] Gourvish and Wilson, *The British Brewing Industry*, 305.

[30] Myers, "The Capital Structure Puzzle"; Myers and Majluf, "Corporate Financing".

[31] Acheson et al., "Corporate Ownership". Notably, founders' shares, which gave founders special rights and privileges, were not common amongst brewing companies – none of the breweries listed in the 1900 *SEOI* had such shares.

[32] *Stock Exchange Official Intelligence* (1900).

[33] See Baskin and Miranti, *History of Corporate Finance*, 152 and Acheson et al., "Corporate Ownership". There was an increase in demand for preference at this time from middle-class investors, who were interested in a regular fixed income, but not in the control of a particular company (Jefferys, *Business Organisation*, 216). Preference shares were therefore attractive to such investors, particularly in an era of falling real interest rates. Indeed, preference shares were widely regarded by investors at the time as a debt-like instrument (Jefferys, *Business Organisation*, 245).

[34] This characterisation is made in the classic work by J. B. Jefferys - Jefferys, *Business Organisation*, 224-5.

[35] *Stock Exchange Official Intelligence* (1900), 862.

[36] *Stock Exchange Official Intelligence* (1900).

[37] *Stock Exchange Official Intelligence* (1900).

[38] Coyle and Turner, "Law, Politics and Financial Development," 836.

[39] Simonson, *The Debenture*, 26; Jefferys, *Business Organisation*, 273; Coyle and Turner, "Law, Politics and Financial Development," 821; Pennington "Floating Charge".

[40] Gourvish and Wilson, *The British Brewing Industry*, 256; Watson, "Banks and Industrial Finance," 64. Notably, debentures in general were popular with investors because of their legendary security (Coyle and Turner, "Law, Politics and Financial Development," 821; Jefferys, *Business Organisation*, 280).

[41] *Financial Times*, 8 June 1897.

[42] Because the shareholder returns were weeded by archivists in the past, records for some firms are sparse and only some annual returns have been preserved.

[43] Returns are adjusted for capitalisation changes such as stock splits.

[44] On this recapitalisation, see the Financial Times 28 February 1906.

[45] Based on data from Mitchell, *British Historical Statistics*, 679. In a similar fashion, the yield on long-term government bonds averaged 2.24 per cent during 1893-98, but was just over 2.80 per cent in the decades either side of this period (Mitchell, *British Historical Statistics*, 678).

[46] Knox, "The Development of the Tied House"

[47] Gourvish and Wilson, *The British Brewing Industry*, 285-6.

[48] Gourvish and Wilson, *The British Brewing Industry*, 285.

[49] Gourvish and Wilson, *The British Brewing Industry*, 295.

[50] Gourvish and Wilson, *The British Brewing Industry*, 292.

[51] Vaizey, *The Brewing Industry*, 15.

[52] Gourvish and Wilson, "Profitability"; Cottrell, *Industrial Finance*, 168. Wilson, *Practical Hints*, 58 suggests that the highest quality companies restricted the amount of debt they took on to the limit of 33 per cent, which was imposed on railway companies at the time.

[53] *Financial Times*, 26 August 1901; Gourvish and Wilson, *The British Brewing Industry*, 295-6; Gourvish and Wilson, "Profitability," 156.

[54] Payne, "The Emergence," 531; Chandler, *Scale and Scope*, 266-7.

[55] Gourvish and Wilson, "Profitability," 157.

[56] Campbell and Turner, "Substitutes for Legal Protection"; Foreman-Peck and Hannah, "Some Consequences".

[57] Chadwyck-Healey, *Treatise*, p.134.

[58] Yermack, "Higher Market Valuation". For a contrary view, see Coles et al., "Boards".

[59] Campbell and Turner, "Substitutes for Legal Protection".

[60] Hermalin and Weisbach, "Boards of directors," 10.

[61] Campbell and Turner, "Substitutes for Legal Protection".

[62] Chadwyck-Healey, *Treatise*, p.134.

[63] Braggion and Moore, "The Economic Benefits"; Campbell and Turner, "Substitutes for Legal Protection."

[64] See Braggion and Ongena, "A Century of Firm-Bank Relationships" who use multiple bank relationships as a proxy for access to credit.

[65] Campbell and Turner, "Substitutes for Legal Protection". See Thomas, *The Provincial Stock Exchanges* and Michie, *Money, Mania and Markets* on Scottish and provincial stock exchanges in the Victorian era.

[66] The brewers in the House of Lords were referred to as 'Beer Barons' or the 'beerage' (Thompson, *English Landed Society*, 297).

[67] The largest eight banks in 1900 in terms of deposits were obtained from the *Banking Almanac and Yearbook* (1900). These eight banks had 33.7 per cent of total UK bank deposits.

[68] See Fernandes and Ferreira, "Cross-Listing" for a discussion on how cross-listing improves price informativeness.

[69] Alternatively, multiple listing could have improved the corporate profile and increased sales (Pagano "The Geography of Equity Listing"). A London listing in particular might have provided benefits to regional breweries trying to break into that market.

[70] Knox, "The Development of the Tied House," 77.