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Bring in the brewers: business entry in the Swedish brewing industry from 1830 to 2012

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ABSTRACT

This article analyses long-term business entry in the Swedish brewing industry, presenting new data on its organisational historiography. Since 1830, the rate of entry has varied considerably; entries increased progressively from the 1850s, and fell at a decreasing rate from the early twentieth century. An increasing tendency to enter the trade can be observed from the mid-1980s – in particular, there has been a considerable resurgence since the turn of the millennium. The article elaborates on explanations that are both exogenous and endogenous. Above all, the results provide support for the role of endogenous conditions. The results should be viewed as complementary to previous analyses of the (Swedish) brewing industry, which either have employed shorter analytical time-frames or have mainly focused on the role of exogenous conditions, such as changes in the institutional framework.

KEYWORDS

Business entry; entrepreneurship; brewing industry; industry development; industrial resurgence; Sweden

1. Introduction

Under what conditions do new firms arise? What can be concluded from when entrepreneurs flock to an industry, and what does a decrease in the rate of business entry imply? Some literature has paid considerable attention to these questions.[1] This article aims to contribute to this stream of research by analysing business entry across nearly 200 years. The empirical material is longitudinal and consists of the life-histories of nearly 500 Swedish breweries that have entered, existed in, and exited from the industrial population between 1830 and 2012. During the period of analysis, the rate of business entry has varied substantially: from the first decades of the nineteenth century, the rate of business entry increased progressively over several decades. In the early 1900s, the entry rates dropped and several breweries failed or were acquired by larger incumbents, marking the onset of a long period of concentration and consolidation. In the three most recent decades, there has been a considerable resurgence and several new entrepreneurs have entered the industry. Consequently, the propensity to start a business in the Swedish brewing industry has varied substantially across time, and the overarching research question in this article is: how can this variation be explained?

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When modelling the breweries' entry rates across time and the development of the industrial population, it became evident that the two trajectories did not entirely agree with previously generated explanations and established conceptions of the drivers of changes in the structure of the Swedish brewing industry. Furthermore, the pattern of business entry followed a course that is similar to several other, and different, industrial populations – including the pattern of resurgence in entry at a 'mature' industrial stage.[2] More importantly, it also resembled the long-term trajectories of the brewing industries in other economies.[3] In this article, I make extensive use of both previous empirical research on the industry and established approaches and concepts in research on industry dynamics. In particular, the literature in organisational (population) ecology is extensively employed as a framework of analysis. This tradition specifically elaborates on both exogenous and endogenous explanations for organisational entry in industrial populations over long intervals.

2. Methodological considerations and empirical materials

It is without doubt a complex set of regularities and idiosyncrasies that can explain business entry, ranging from the level of the individual to the macro level, where both supply-side and demand-side conditions are significant.[4] Business historians have often addressed the formation, growth and fates of enterprises through exhaustive case studies, where the decisions and behaviours of founding entrepreneurs, owners, and managers are analysed in relation to the economic, social, institutional and historical context of the business. The mode of research has regularly been idiographic, emphasising managerial decision-making and control.[5] An alternative strategy is to consider an industry in total, studying its organisational historiography. Such an approach will almost inevitability prevent the inclusion of several significant aspects – in-depth case studies are able to consider connections between structure and actors. But the alternative approach has some advantages: it makes it possible to identify and separate the unique from the general.[6] Additionally, in using longitudinal firm-level data that is 'complete' in the sense that it records all firms entering and exiting from the industry, an understanding of the underlying mechanisms that drive socio-economic systems over time can be achieved. Bias towards researching 'successful' cases has the risk of disregarding previous failures and successes that were, or are, integral parts of the system of organisations in the industry. As maintained by Garnett, Mollan and Bentley in a recent special issue on 'new business history' in this journal,[7] treating all organisations in an industry as a system of discrete, interrelating agents opens up research to the likelihood that an industry is defined both by the relationships between businesses through time, and by decisions and actions taken by individual businesses. Recent interdisciplinary approaches to business history have advocated, and have made use of, these types of research strategies and techniques, and in this article, I draw on this methodological approach.[8]

This study complements previous empirical research by considering organisational and industrial change in the entire Swedish brewing industry over an extended period of time. The approach of including of all firms entering the industry makes it possible to investigate changes in entrepreneurship across time. This involves considerations of changes in the industrial population and of modelling of entrepreneurship across time. Counting, constructing databases, and testing hypotheses have the potential to contribute to business history. Prior to the 1960s, business historians invested substantially in entrepreneurship before attention was turned towards the growth of big businesses and their organisational structure: as

asserted by Jones, van Leeuwen and Broadberry, explaining why and how entrepreneurship differs between time periods – and why and how this matters – is a broad important issue for business history research.[9] How can this be achieved? One requirement is the ability to measure entrepreneurship. This phenomenon embodies several and sometimes contradictory definitions, of which none is 'ideal.' Some definitions principally aim at (identifying) the individuals, or processes, that lead to entrepreneurship; others mainly aim at measuring entrepreneurial outcomes. *Organisational creation* has been one common measurement of entrepreneurship. Therefore, and leaving aside whether entrepreneurs' decisions to enter an industry are intelligent or irrational, wisely planned or spontaneous, several strands of literature consider organisational creation as a manifestation of entrepreneurship.[10] Another requirement, and in line with Jones et al.,[11] is the capability to determine how changes in new venturing activity occur over time. With notable exceptions, and often as a result of data scarcity, longer quantitative observations of entrepreneurship have received quite scant attention. The methodology of the historian – to make use of different sources and archives – is a promising way of constructing extended and consistent databases that are able to answer these questions.[12]

Research in entrepreneurship and industrial dynamics asks what drives entry and exit processes across time and place. Asking these questions, it is useful to distinguish between the supply- and demand-sides of the economy. Both conditions have received considerable attention in several literatures, including business history; they are held as drivers of entrepreneurial behaviours and thus, of entrepreneurial outcomes. Demand-side conditions are often considered to shape the opportunities for entrepreneurs.[13] Explanations in the economic and entrepreneurship literatures tend to mainly, although not solely, focus on exogenous explanations and on the demand-side – specifically, how technological, political and regulatory, and social and demographic changes affect entrepreneurial opportunities.[14] The literature in organisational ecology, rooted in organisational sociology, basically asks the same questions. However, according to this tradition, not only exogenous conditions will affect entrepreneurship. It is primarily the very system in which firms operate that affects entry and exit processes – specifically, the structure of the industrial population and changes in structure across time. Therefore, supply-side structures, *endogenous* conditions, are maintained as the main explanation for changes in entrepreneurship.[15]

Either of these two views, aiming at capturing general patterns and regularities of entrepreneurship, risks reducing the role ascribed to human agency.[16] However, as recently proposed by de Jong et al.,[17] and in line with alternative approaches in business history that utilise data on complete industrial populations,[18] research that takes on both endogenous and exogenous aspects of firm behaviour has the potential to serve as a fruitful research engine. Firms and organisations interact and they copy successful strategies, thus producing herding behaviour. According to this argument, the choices and actions of individuals are of importance, but more for their own organisation than for the total population of organisations in the industry. Therefore, an alternative approach, suggested in recent business history discussion, is one that takes on the complete development of entrepreneurship over time. This view is complementary and does not exclude human action, but it reduces its primacy – under conditions of uncertainty and competition, there may be constraints on the ability of managers to affect the development or the fate of their business.[19] This alternative approach is also in line with recent business history discussion on how historical approaches can contribute to the understanding of entrepreneurship. Mainstream

entrepreneurship research has often been ahistorical. However, as shown in the business history tradition, entrepreneurship has been found to be determined by cumulative path-dependent processes and by institutional conditions. An analysis that addresses these processes, and the dynamic relationship between the entry of new firms and the industry in total over longer periods, can contribute to research in entrepreneurship.[20]

In this article, I present an account of the brewing trade in Sweden from the early nineteenth century and an empirical description of business entries, as well as of the development of the industrial population. Using new and unique data, I seek explanations for changes in the industry in earlier empirical research and in research traditions with an interest in longer changes in firm entry and exit. Several descriptions and analyses of the Swedish brewing industry have been generated. One type of research involves quite descriptive studies consisting of both micro-level and idiographic studies of individual breweries or brewing families,[21] and of exhaustive overviews of the history of beer and the Swedish brewing trade.[22] Other research has a more distinct theoretical and explanatory framework, analysing the strategies of major firms and other actors and interests, and how industry structure has been affected by institutional transformation, collusion and technological change.[23] A similar strand of analysis – both research[24] and public investigations[25] – has focused on the role of government policy, and on government involvement and ownership in the industry, during specific periods. To the best of my knowledge, there does not exist any systematic analysis of longer changes in entrepreneurship and structure of the Swedish brewing industry. Earlier analyses have not primarily focused on changes in the structure of the industrial population or on variations in business entry (or exit). Furthermore, the period of analysis has commonly been shorter than in the present article, drawing conclusions from aggregated data that describes production plants, and not business organisations. This type of data measures net variation in structure and cannot capture any gross changes. Data on net variation commonly obscures observations of gross changes in any kind of population; however, gross changes in entry, and in exit, can be substantial over both short and long periods.[26] This article uses longitudinal data collected at the firm level, and it considers gross variation in business entry.

The choice of 1830 as the starting year is to some extent arbitrary, but consistent empirical data for earlier periods is scarce. A more distinct entry activity can be observed from the late 1840s, but one of few exceptions, and commonly regarded as the first industrial brewery in Sweden, is Lorents Porterbruk. This was a Porter brewery founded in Gothenburg in 1813 by the German immigrant Abraham Robert Lorent. However, it was to become more renowned as Porterbryggeriet D. Carnegie & Co; Lorent lost his fortune to speculation and after his demise, the brewery was acquired in 1836 by the Scottish businessman David Carnegie, Jr.[27] The starting point of the article consequently precedes the 'founding' of D. Carnegie & Co by six years, and it precedes the first noticeable take-off in business entry by some 15 years. The parameters of the present article are therefore set to take into account a sufficiently long period for the analysis of changes in entrepreneurship in the industry.

2.1. Empirical materials

The empirical data has been collected from several printed and unprinted sources. The main empirical source is the compilation on Swedish breweries published jointly in 1994 by the two brewing industry associations Sveriges Bryggmästare Förening, and Svenska Bryggareföreningen[28] the compilation has been used only to little extent in past research.[29]

SBF mainly records breweries from the first decades of the 1800s, ending in 1993. SBF lists entry and exit dates of breweries and their geographical location; it occasionally reports mergers and acquisitions and names of founders and subsequent owners and managers. Data on organisational size, output, etc. is not recorded, and the compilation is also somewhat unsystematic and fragmented. To begin with, it generally inflates the true number of breweries since the one and same brewery may appear more than once (due to name changes or variations in spelling). Additionally, analytical levels are sometimes confused – some breweries are reported at the (physical) plant level, implying that multi-plant breweries are recorded more than once. Furthermore, several closure dates (or merger dates) are unknown. Other sources also reveal that some dates are erroneously reported – sometimes by several decades. Finally, the compilation does not include all producers of malt beverages ever to have existed, and this is mainly for three reasons. First, a substantial number of breweries in the 1800s and the early 1900s solely produced Small Beer (*Svagdricka*) – a top-fermented, sweet low-alcohol beer. SBF excludes several of these breweries and only reports 'taxable' breweries (those producing malt beverages with an alcohol percentage above 1.8%); however, breweries that periodically produced taxable beverages are included.[30] As far as I am aware, systematic data on the total number of producers of all types of malt beverages are not readily available.[31] Second, alternative sources also reveal that SBF fails to report some breweries that entered the industry in the late 1980s and early 1990s. Third, and evidently, SBF also ends in the early 1990s.

With the purpose of completing the data in SBF, as well as extending it prospectively, I have used a variety of sources and archives. Data on major recent changes in the industry are easily obtained via existing business databases; however, it has been necessary to use additional sources, and this data collection strategy has improved the possibility to obtain a more complete mapping of the industry. For supplementary data on the entry and exit dates of principally older breweries in SBF, I have employed various materials from the Swedish National Archives. Past empirical research on the Swedish brewing industry has been of equal importance in this process.[32] When extending the data set forward in time (c.1994–2012), I have used lists published by industry associations and brewing societies on (chiefly) active breweries, and business databases that cover the period from around 2000 and onwards. These materials are valuable, but they are also cross-sectional and thereby inflicted with survivorship bias – specifically, firms that entered in the mid-1990s, but that vanished in the early 2000s, are generally not recorded. Furthermore, if the aim is to map firms according to what they actually do (or what they claim that they do), the accuracy of business databases could be questioned; industry classifications (e.g. NACE or SIC) may often lead to inaccurate estimations of the actual number of existing firms at a given point in time.[33]

In order to fill this gap, I have conducted examinations of alternative sources.[34] This approach also relates to previous attempts at collecting data on breweries, namely to make use of compilations and lists generated by various enthusiasts and groups on the Internet. Some are very thorough, recording entering, existing, as well as discontinued breweries in Sweden, in the three most recent decades.[35] By combining these different materials, it has been possible to construct a long database on business entry and exit in the Swedish brewing industry. I have also complemented this database with additional empirical information on economic indicators, derived from historical statistical publications and previous research.

3. The Swedish brewing industry from the early nineteenth century

The number of business foundings in the brewing industry increased from the 1840s, peaking in numbers in the 1890s. A plausible explanation for the changes in entrepreneurial activity, as well as for the formation of the modern Swedish brewing industry, is technological – specifically, through the introduction of new types of beer. Until then, malt beverages had been top-fermented, but the influence from Central Europe and Germany became considerable from the early 1840s: Bavarian bottom-fermented beer (*Bayerskt öl*) was introduced in 1843, resulting in new production methods and in better quality of the product.[36] Swedish brewers were also increasingly receiving education in Imperial Germany and later on in the Weimar Republic, as well as in Austria-Hungary; additionally, several founders or brew masters were of German origin.[37] Two other types of beer were of importance in the second half of the nineteenth century: the sweet Small Beer and the lighter, top-fermented Pilsner Lager. Small Beer has a long history in Sweden; the consumption of the product was considerable during the entire 1800s and long into the 1900s. The Pilsner Lager was introduced in Sweden in the late 1870s and it quickly became popular.[38]

The largest breweries substantially increased their production capacity from the 1890s, mainly due to several imported innovations. Electricity, cooling machinery, cultivation of yeast, and improvements in the production process (such as beer filters) were introduced and this raised aggregate production in the industry substantially. Additionally, improved railway transport facilities helped existing breweries extend their markets. These changes lead to intensified competition.[39] Furthermore, significant economic liberalisations in the mid-1800s – the Decrees of Freedom of Trade in 1846 (partial freedom of trade) and in 1864 (full freedom of trade) – removed several previous obstacles, privileges, and monopolies such as the guild system; the market for malt beverages became practically unregulated and exempt from taxation.[40] These overall institutional changes, which also included other institutional innovations such as the introduction of the joint-stock company as a form of economic organisation, provided opportunities for entrepreneurs and investors to participate in the formation of the modern brewing industry.[41]

In the early 1890s, minor legal interventions with the purpose of stopping drunkenness and improving social order were introduced and several more restrictions were imposed over the following decades. Brewing was to become the exception from the government's gradual monopolisation of the Swedish alcohol market; however, the changes were to imply a very new set of conditions. In 1903, the Swedish Parliament decided on a taxation of malt; the production of low-alcohol beer became exempt from taxation and tax-free breweries were separated from taxable breweries. More profound policy changes from 1917 affected production, distribution as well as consumption. A rule of concession for the production of beer was introduced, thus implying increasing difficulties for new breweries to receive permission. Furthermore, from 1917, it was, in practice, forbidden to distribute beer with an alcohol content higher than 3.6% in volume ('Strong Beer;' *Starköl*) while, at the same time, consumption became heavily regulated with the introduction of a booklet regulating the maximum monthly amount of alcohol that each citizen was allowed to buy. This rationing system also resulted in all alcoholic beverages being distributed via state-owned shops (Systembolaget) and this system has partially remained into our time.[42]

The political and social attitudes toward alcohol consumption became more liberal after the end of World War II (1939–1945). The booklet was abolished in late 1955, along with the

restrictions on imports and distribution of Strong Beer; however, both wholesale and retail of all alcohol products were still under the control of Systembolaget.[43] Furthermore, stricter laws on the marketing of alcoholic beverages were introduced in the 1970s, and there was a political debate around suggestions to nationalise the brewing industry. The government had also successively increased its ownership in the largest brewery, Pripp Bryggerierna (commonly known as Pripps), controlling it from 1974 for two full decades.[44] The plans for nationalisation were eventually abolished and by the mid-1990s, the ideological pendulum had swung in the other direction.[45] The almost complete alcohol monopoly of the government ended in 1995 when Sweden joined the EU. Even if Sweden was granted several exceptions, such as the preservation of the Systembolaget shops and a gradual adaption to the Common Market rules, the EU-membership implied several liberalisations – today, the sole (monopoly) function of Systembolaget is alcohol retailing.[46] The present-day retail market partially echoes the initial organisation from the mid-1950s, and it has been argued that this organising principle for retailing has made it quite unproblematic for smaller breweries to distribute their products both at the regional and national level.[47]

A nationwide brewing cartel emerged at the beginning of the twentieth century and it was officially formed in 1906. The cartel, preceded by various regional price and quota cartels in the late 1800s, was formed as a response to the increasing regulations and the rising political influence of the Temperance Movement.[48] The new regulations and the increasing power of the cartel, which created regional monopolies, depressed competition. After World War II, the cartel was challenged from several directions: the Social Democratic Government started to implement anti-trust policies, and there was a substantial increase in the imports of beer. Ultimately, and coinciding with the new policy framework, this led to the dissolution of the cartel in the mid-1950s. From this decade onwards, there was an increase in economies of scale and industrial concentration was intensified: aggregate output in the industry increased at a faster pace and the number of breweries in the trade fell – the post-war grand finale came in 1964 when the two largest competitors, Stockholms Bryggerier and Gothenburg-based Pripp & Lyckholm, formed the giant brewery Pripps, and it became the dominant actor in the industry.[49] In 1974, the Swedish Government obtained a majority in Pripps; Swedish Volvo and Norwegian Orkla acquired Pripps in 1995 and, in 2000, the brewery was bought by Danish Carlsberg.[50]

This short description does not mean that the expanding brewers stood entirely unchallenged after World War II. Incumbent medium-sized, often regional breweries tried to compete with the dominant brewers, but most of them failed in their attempts or were ultimately devoured by their larger counterparts.[51] Spendrups Bryggeri, a brewery on the brink of failure in the 1970s, is one of few exceptions, becoming the most serious competitor to Pripps.[52] In the most recent two to three decades, several new breweries have entered, and the micro-brewery is today the dominating organisational form in the industry.[53] However, and analogous to several other economies, the total market share of micro-breweries is relatively small and the industry is still dominated by a handful of large brewers. The largest producer ever since the turn of the millennium is Carlsberg Sverige (formerly Pripps), followed by family-owned Spendrups Bryggeri. Together with Åbro Bryggeri (also family-owned) and Kopparbergs Sofiero Bryggeri, these breweries represent nearly three quarters of the market and they are generally diversified, distributing several beer brands (domestic and imported) as well as products such as ciders, soft drinks, water, wines and spirits.[54]

3.1. Business entry and industrial development: growth, decline, and resurgence

We now turn to the central question of this study: business entry in the Swedish brewing industry, 1830–2012. Figure 1 builds on new historical longitudinal data and it describes two related trajectories: yearly gross entry rates of business firms, and the development of the industrial population, describing net variation across time. The business entry rate is defined as the number of new business firms entering the industrial population at a specific year, and it does not include subsidiaries or the founding of new production plants by incumbent breweries. The industrial population is defined as the number of existing business firms in a specific year; in calculating the industrial population, a business exit is defined as when a brewery leaves the population either by closure, or by merger or acquisition. In that respect, the trajectory of the population is an indirect measure of concentration.[55] As can be observed, both the rate of business entry and the development of the brewery population display a substantial variation over time.

Figure 1 shows that the rates of founding started to increase from around the mid-1800s (and it can be noted that this take-off coincides with the introduction of Bavarian beer). The entry activities varied over time, but the trend was generally positive for several decades; the entry rate peaked in the 1890s and fell thereafter. Overall, the rising rates of foundings and relatively low exit rates (not reported here) between the 1840s and the 1890s increased the absolute number of breweries. The industrial population peaked around a decade after the peak in business entry, in 1906, and the nearly constant fall in the number of breweries in the population from this year implies that the exit rates were almost always higher than the entry rates. The level of business exits increased from the late 1880s and escalated in the two following decades. It can be noted that while the business entry rates decreased rather dramatically from the early twentieth century, they did not entirely come to a halt – not even after the regulations from 1917. In a comparative perspective, the rate of entry fell even

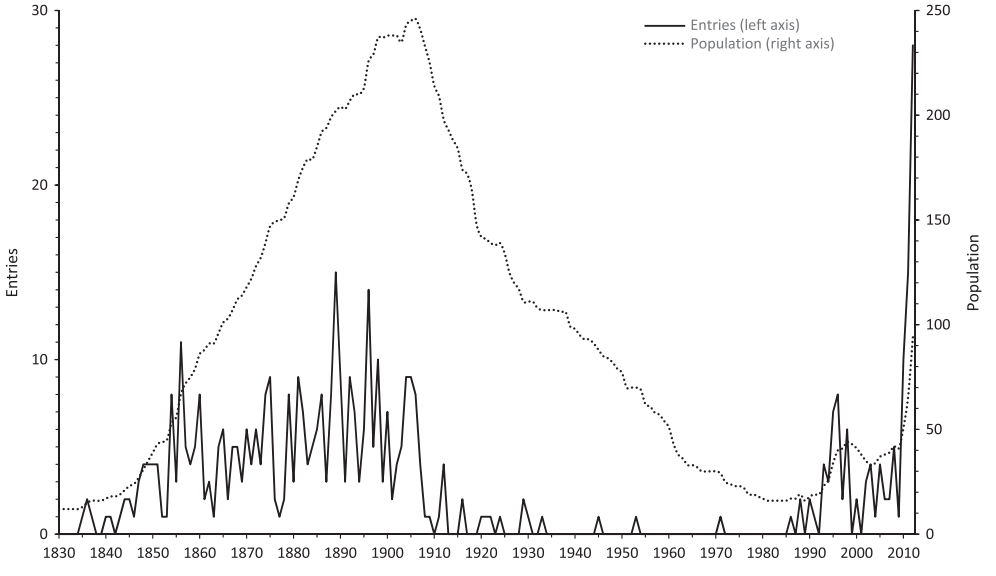

Figure 1. The Swedish brewing industry, 1830–2012: business entry rate and industrial population. Sources: see Section two; author's calculations.

more from the second half of the 1930s and, in that particular respect, the period c.1935–c.1985 stands out as exceptional. The propensity to start a new business in the industry changed in the late 1980s, with a more noticeable take-off in foundings in the first half of the 1990s. This first 'wave' of entry came to a halt after some years when, around the turn of the millennium, several newly-established breweries exited the industry (see the relative decline in the brewery population in Figure 1). However, it can also be observed that founding activities did not entirely cease during the shakeout. The most noticeable increase in the industry – a second 'wave' of entry – has commenced quite recently; in absolute terms, the final observation year in this article (2012) exceeds any other year.

How can these changes be explained – can we conclude that the new rules of the game from the early twentieth century, especially those imposed in the late 1910s, affected the propensity to enter the industry, as suggested in earlier research? It is a plausible account; the data in this article demonstrate a general fall in the level of business entry from these years. The previous period, c.1865–c.1900, has been described as a practically 'unregulated' industry, and the institutional and economic framework during that period appears as a logical explanation for the comparatively high rates of entry. Earlier analyses assert that the Swedish brewing industry was fully formed around 1890 – from that point in time, a concentration process started in which mainly smaller breweries were acquired by larger actors. According to previous research, the 'founding era' in the Swedish brewing industry reached its peak in the early 1900s, which was an outcome of the introduction of taxation of malt in 1903.[56] The institutional changes in the early 1900s have therefore generally been viewed as important explanations for the net fall in the number of breweries (rather: in production plants) in the industry. Cartelisation had begun already in the late 1800s, and the nationwide cartel was formed in 1906. Particularly the changes from 1917 have been perceived as a genuinely new set of external conditions for the industry; regulatory authorities almost consistently rejected applications for concession during the interwar years, thus implying high barriers to entry.[57] The cartel's increasing influence on the market was also actively supported by governmental authorities, believing that reduced competition would lead to lower alcohol consumption, which distorted the terms of competition in the industry. For that reason, earlier research has asserted that the structure of the industry was more or less conserved during the interwar years.[58]

However, and turning to the core research question in this article, what were the implications for entrepreneurial opportunity in the industry from the stricter policy and from cartelisation – as well as the subsequent decartelisation in the mid-1950s? Prior to World War II, and as in several other European countries, Swedish economic policy was generally positive when it came to cartels – however, after the War, Sweden came into the forefront on decartelisation,[59] including the brewing industry. Business historians regularly maintain that the competitive environment for firms is structured by public policy. Policy creates restrictions and incentives, and it ultimately affects the structure of industries – in this process, cartels forestall concentration and they stabilise the industry.[60] This also seems to have been the case in Sweden after the formation of the cartel in 1906: due to the cartel agreement, the larger breweries were unable to exploit scale advantages and thereby unable to force prices downwards – it was not until the decartelisation in the mid-1950s that concentration in the industry increased substantively.[61] Similar results have been found in past research on other industries: Dobbin and Dowd's study of foundings of railroad corporations in the US shows that pro-cartel policies prior to 1897 mitigated price competition and

boosted rates of business entry while the following antitrust policy stimulated competition and concentration, thus discouraging new venturing activity.[62] Economic theory generally asserts that if cartels cannot prevent new firm entry, the profit of the cartel will attract new entrants – consequently, the success of a cartel depends on barriers that prevent entry.[63]

Therefore, it is not unlikely that the relative increase in new venturing activity during the initial years of the twentieth century can be explained by the cartelisation process. However, when inspecting the decrease in the number of firms in the industrial population from the early 1900s, it is hard to maintain that this structure remained even somewhat intact as claimed in previous analyses; between 1919 and 1939, the industrial population was reduced by more than a third. Thereby, even if the concentration process was partially or temporarily delayed, consolidation was substantial; the combined effect of the new regulatory entry barriers in the late 1910s and the increasing influence from the cartel, creating regional monopolies, may have reduced the rates of new entries. Yet, as can be observed, falling entry rates were also part of a more protracted process. New breweries were founded after the introduction of taxation of malt in 1903 – in fact, the founding activities even increased after this reform – and new breweries also entered the trade after 1917, but at a decreasing rate. Therefore, and partly at odds with previously generated conceptions, one conclusion is that the falling tendency in the propensity for entrepreneurs to enter the trade was a more extended process. This trend started in the 1890s – the peak decade for business foundings in the industry – and it continued for some 80 years.

After World War II, and especially from the mid-1950s, the government implemented an economic policy aimed at increasing competition and securing the right of establishment. Incumbent cartel breweries became subject to strong exogenous pressures from larger counterparts that drew on economies of scale and scope. The majority of small and medium-sized breweries had little capacity to adapt to these new conditions, and the industrial population therefore fell – often in several waves of mergers and acquisitions.[64] The reforms in the mid-1950s affected both the supply side – with the aim of lowering entry barriers and preventing collusion – and the demand side (with a less strict policy agenda on alcohol consumption). Did these changes have an effect on the propensity to found a new business? It has been claimed that the new rules of the game and the dissolution of the cartel led to new actors entering the market. Yet, these were either already established breweries that had not been members of the cartel or incumbent breweries with new owners.[65] As can be observed (Figure 1), practically no genuinely new brewery was founded when the institutional framework changed. Both contemporary observers and later analyses maintain that this was an outcome of increasing concentration and competition. The number of production plants fell at a progressively decreasing rate from 1955 in comparison to the three preceding decades;[66] the data of this article supports this observation. However, in a comparative perspective, the rate of new foundings remained exceptionally low – and it had been low ever since the mid-1930s. This was a decade signified by business conditions that were substantially different from those imposed from the mid-1950s. Once more, a complementary interpretation is that the tendency to enter the brewing industry should be considered from a longer time perspective.

By the mid-1980s, the remaining number of breweries had fallen quite substantially from the peak in 1906. The industry was dominated by a small number of large producers that fought a war of attrition in which the largest brewery, Pripps, was government-owned.[67] In 1992, the Swedish Competition Authority conducted an analysis of the trade, concluding

that it had been signified by extensive structural changes over the past decades. This had resulted in massive concentration and significant economies of scale; without any substantial reforms, the chances for smaller breweries to succeed in the trade were considered as small.[68] However, it was also around these years that a number of breweries succeeded in entering the trade, generally starting on a small scale: nearly 15 new breweries were founded between 1985 and 1994, and this figure surpasses the total rate of entry in the full five preceding decades. As has been noted, a more observable proliferation of breweries started in the early 1990s. These changes have been explained by deregulations and liberalisations – especially by the Swedish membership of the EU from 1995; a popular conception is that it marked the start of the micro-brewery trend in Sweden.[69] But to the best of my knowledge, consistent accounts are generally lacking and earlier research has recognised a rather wide range of both supply-and demand-explanations pertaining to mainly exogenous conditions: 'local tradition'; an increased supply of available brewing facilities from closed breweries (i.e. technological); increasing public support for new-firm creation (which encouraged individuals to enter the brewing trade), and a 'renewed' consumer interest in beer.[70]

The Swedish membership of the EU in 1995 implied several liberalisations on production, distribution as well as consumption of alcohol. It also involved the lifting of earlier restrictions on imports and this lead to an intensified private cross-border trade, much to the disadvantage of Swedish breweries. During the 'Brewery Crisis' in the late 1990s and the early 2000s, several new breweries failed and surviving breweries – both recent entrants and incumbents – were struggling with economic difficulties. Contemporary observers presented a dismal future of the industry;[71] in the early 2000s, the CEO of the largest producer, Carlsberg Sverige (formerly Pripps), even predicted the demise of one of the largest breweries.[72] However, in the mid-2000s, several new breweries were founded, and none of the large incumbents have yet failed. Did the crisis affect the propensity to enter? The data in this study show a gross exit rate of 20 breweries between 1999 and 2004; yet, the shakeout did not entirely preclude entrepreneurs from entering the trade since 10 new breweries were formed during the crisis years (Figure 1). Overall, it is reasonable that the conditions from 1995 implied significant changes in the opportunities for entrepreneurs to enter the industry. It is also likely that these conditions may have positively reinforced the entry trend over time, as well as providing a reasonable account for the shakeout at the turn of the millennium. However, these accounts appear to be partially incomplete: the tendency for new ventures to enter the brewing trade started earlier.[73] Additionally, the dominance of a few major breweries, such as Carlsberg/Pripps and Spendrups, has persisted practically ever since the 1960s, and this oligopolistic market structure does not seem to have precluded new entrepreneurs from entering into brewing – neither in the late 1980s nor in more recent times.

4. Analysing business entry in the long-term

By viewing an industrial population as a system of discrete, interacting agents across time, new and complementary interpretations of drivers of change in business behaviour can be identified. The timing of particular events and idiosyncrasies may prove to be unrelated to observed changes in an industry. Therefore, too much emphasis on both historical and contemporary peculiarities of industry development may fail to identify generalisable mechanisms for changes in entrepreneurship across longer intervals – patterns that are similar to other industries.[74] Several frameworks are available for analyses of business entry. Models

in economics provide tools for this type of analyses, but these are often cross-sectional in nature; almost no models that intend to explain entry in particular sectors at particular periods can be directly modified to explain 'the longer term movements in entry and exit that we typically observe over an industry's life cycle.'[75] Evolutionary economists have developed longer models that focus on the (exogenous) role of innovation and technological change. In these models, the industry or product life cycle is typically assumed to contain a first phase in which entry rates gradually increase and exit rates are low. As a result, the number of firms increases until there is a shakeout, caused by exogenous technological change; exit rates remain steady or rise over time.[76] The number of firms in the industry stabilises at a level lower than before the shakeout; the industry has now reached maturity, and the propensity for entrepreneurs to enter falls.[77]

Indeed, the two trajectories of business entry rates and the brewery population correspond to this pattern, but only to the mid-1980s. An alternative theoretical framework is offered by the organisational ecology literature, which addresses the influence of both exogenous and endogenous factors, but where the key factors are held to be endogenous to the industrial population.[78] Furthermore, the time frame of study is commonly very long, often stretching over an entire century or more. Such an extended period of analysis also makes it possible to identify potential secular movements.[79] As has been observed in this article, such a secular movement became apparent from the late 1980s. The organisational ecology framework therefore appears useful for this article, and in the subsequent analysis, two closely-related theories in this tradition are used as analytical tools: the core theory of density dependence, and the temporal heterogeneity theory, which addresses resurgences in business entry. At the same time, the overall research approach in this article will also be able to test previously generated explanations to changes in the Swedish brewing trade.

4.1. Industrial density and resurgence at mature industrial stages

The organisational ecology literature uses a set of concepts and explanations that are believed to be universal for the development of a wide variety of industrial (or other organisational) populations. The organisational ecology-framework defines an industry – an industrial population – as all firms that are dependent on a common set of social and material resources for their survival and growth. Thereby, it includes all actors that compete or may compete for these resources: while a subset of firms may not directly compete with another subset of firms at a given point in time, they may do so at another stage.[80] In this tradition, the *organisation* is the principal unit of observation.

In explaining organisational entry (and exit) across time, organisational ecology starts out from a set of conceptual and theoretical accounts. One such account is the environment for firms, represented by macro environments and task environments, respectively. Much research includes variables that measure the macro socio-economic environment – such as the Gross Domestic Product (GDP), or dummies for wars or depression years – that generally are thought to affect the propensity to enter. For instance, it likely that increases in aggregate demand have a positive effect on business conditions. Furthermore, a task environment is specific to the industrial population and relates to variations in market size or demand, or to various industry-specific institutional conditions. In some ecological studies, the very age of the population (industry) has been treated as a population-specific environmental factor, considered to reflect the accumulated stock of organisational knowledge in the industrial

population. Another main account in organisational ecology concerns endogenous and exogenous processes. Even if exogenous structures or events such as economic crises, wars, or exogenous changes in technological, institutional and cultural conditions are acknowledged to affect business entry rates (and exit rates), endogenous changes – changes in the industrial structure – are considered to have more similarity across a great variety of organisational populations than exogenous change. Entrepreneurial opportunities are thus primarily shaped by endogenously determined supply-side structures.[81]

A central concept in the ecology literature is the notion of *population density*, which is equal to the number of organisations that exist in a particular population at a specific point in time. The core theoretical assumption in the organisational ecology literature is that the variation in both entry and exit rates is caused by such population-endogenous processes; the *primary* environment for an individual firm is therefore the population of which it is a member. There are two processes that will affect changes in the propensity to enter an industry: the processes of *legitimation* and *competition*. These are *density dependent* processes – population-endogenous processes – and they are considered to have more robust effects on organisational entry rates than exogenous processes. According to the density dependence theory, population density shapes the processes of legitimation and competition. Several empirical studies of the evolution of different organisational populations have shown that the early history of populations typically includes a small number of organisations. At some point in time, the number increases rapidly, followed by stabilisation or decline. This is considered to be the effect of legitimation and competition.[82]

Legitimation refers to a 'fact-like' status in which the organisational form receives social acceptance in a very wide spectrum. At the 'birth' of an industrial population, the process of legitimation dominates over competition, even though this does not imply a complete absence of the latter. At the stage of legitimation, new organisational forms must often struggle to get support and acceptance from customers, suppliers, creditors, as well as from authorities. It is the increased presence of new organisational forms that gives legitimation; when a specific organisational form spreads and is successful, and thereby is institutionalised, the legitimation of this organisational form increases. As several more firms start to enter the industry, the process of legitimation is completed. Subsequent organisations that enter have no further effect on the process of legitimation – they instantly receive social acceptance and legitimacy.

As a population grows, competition increases. Small, initial increases of new members in the population will not intensify competition – rather, competition starts after a particular threshold in density. Thus, at some point, the population reaches its carrying capacity – from here, processes of competition will be stronger than processes of legitimation. In this theory, competition does not primarily denote price competition. More precisely, price rivalry should be viewed as a subset of the concept of competition. In the ecology framework, changes in diffuse competition will affect the propensity for entrepreneurs to enter an industry. Diffuse competition is the negative effect of the presence of one or more actors on the growth or life chances of some focal actor – the theory views all firms in the population as parts of a system. Therefore, when population density is high, the entry of one or more actors into the population implies great increases in demand of the population's resource base. In these situations, small increases in entry rates greatly increase competition (and will lead to increases in exit). Competition is diffuse since incumbent firms in the population do not necessarily take, or are able to take, account of each other's actions – even

if they all belong to the same system of organisations, an incumbent firm does not even have to be aware of the existence of all actors in the system or that new actors have entered.[83] In effect, as the level of diffuse competition increases, more of the external resources required to build and sustain firms in the industrial population have already been claimed by other firms. The population's supplies of potential organisers, members, customers and resources for production become exhausted. Thus, the industry's environment sets the carrying capacity of the population.[84] In this theory, a falling population density implies increasing concentration – concentration is therefore an outcome of entry and exit, as well as of business growth and decline.[85]

Legitimation and competition will have very different effects on business entry rates across time. As a small industrial population starts to expand, there are legitimacy gains to receive. Entrepreneurs as well as creditors recognise its viability and entrepreneurs increasingly start to use the organisational form, thus creating a herding behaviour. This means that population density has a positive impact on entry rates at the onset of an industry since legitimation – low but rising density – accelerates entry activities. These legitimacy gains will eventually diminish as the population expands further. When the population reaches its carrying capacity, competition will dominate over legitimation; entry rates decline since fewer potential entrepreneurs will have incentives to enter. According to the organisational ecology literature, this tendency is also often reinforced by other structures in the system – for instance, investors avoid participating in ventures in highly competitive industries. In this process, increasing competition also leads to increasing exit rates, thereby lowering population density. Therefore, the core density model in organisational ecology predicts nonmonotonic entry rates: when an organisational population grows, legitimation increases at a decreasing rate, and competition increases at a growing rate, which implies that there will be an inverted U-shaped relationship between entry rates and population density. As noted by several authors, the density dependence explanation is based on an indirect measure – population density – of the underlying causal processes of legitimation and competition.[86] However, the theory has been found to be valid for variations in entry rates in a wide variety of organisational populations.[87] The theory has also generally been confirmed in analyses of long-term changes in entry in the brewing industries in the United States[88] and in Germany.[89]

The theory of density dependence is considered to be less able to account for resurgence in mature industries, since it treats the processes of legitimation and competition as timeless functions of population density. This implies that once a population has been reduced, and competition dominates, new entrepreneurs will be less inclined to enter. As noted earlier, this assumption is also generally maintained in evolutionary economic models: as an industry matures, concentration will increase, elevating exit rates and impeding potential entrepreneurs to enter. But what can explain the proliferation of new firms in a mature industry, such as the Swedish brewing industry from the late 1980s (as well as in other economies, such as the US brewing industry from the 1970s)? One useful way is to make the qualitative division between generalist and specialist firms. Firms attempt to find a viable position within their market by targeting their business to various segments. Firms that pursue the strategy of a wide market niche are diversified and are thus generalist firms. Specialist firms choose narrow, homogenous targets and are often smaller. It is in mature industries, commonly characterised by scale advantages, that such a partitioning of the market occurs. Thus, high concentration and consolidation and the dominance of a small number of large generalist

firms will lead to an unexpected outcome – over time, it will increase the opportunities for smaller specialists to enter. As the number of large generalist producers moves towards oligopoly, the opportunities for small specialist producers improve. Specialists are firms capable of exploiting peripheral resources and areas in the market without directly competing with the large incumbent producers. Late-stage industrial renaissances therefore principally mean proliferation of small, specialist organisations that avoid direct scale competition and rivalry with larger generalists.[90] Established economic models would predict the opposite – highly concentrated markets and few dominant generalists create barriers to entry – thus, new firm entry becomes *less* likely.[91]

The development of the Swedish brewing industry in the three most recent decades gives support for this explanation; earlier research shows that micro-brewers consider the large and established generalist breweries as their main competitors – not other micro-breweries. Established and large brewers, on the other hand, perceive their large counterparts as their main rivals; to them, micro-breweries have a positive and complementary function on the market.[92] A number of organisational ecological studies – of which several specifically study the brewing industry – maintain support for this argument. In their study of the emergence of micro-breweries in the US brewing industry, Carroll and Swaminathan maintain that increasing industry concentration and consolidation eventually raised the entry rate of micro-breweries.[93]

Why is it so? The theory of temporal heterogeneity, or the 'resurgence hypothesis', developed by Hannan,[94] maintains that simple persistence of a population has generated a *constitutive* legitimation. An old population has received legitimation by sheer longevity; it has developed durable ties with its environment and with diverse actors, implying that changes in population density should not affect the population's fact-like status. Hence, as a population grows older, the relationship between density and legitimation becomes increasingly 'sticky.' The same mechanism of 'stickiness' is also at hand in the relationship between density and the other main process, competition: in the early history of a population, each firm is a potential competitor – there are no stable distinctions between products, and firms have not had the time to build up statuses and reputations. In this phase, changes in density will have a strong effect on competition. However, over time, firms build up identities, alliances and supply-chains. Actors in the system also take account of the population's existence in structuring their activities – governmental agencies take the organisational form into account, creating rules and regulations, and the occupational system structures itself around the population by forming labour unions.[95] In Sweden, the process of constitutive legitimation of the modern brewing industry appears to have commenced around the final decades of the nineteenth century, from which modern institutions around the industry evolved, including legislation and taxation (see section three); furthermore, the largest industry association was formed in 1885, and attempts at unionisation of brewery workers commenced in the late 1880s. These structures have essentially remained.[96]

Second, over longer periods, diffuse competition – the main mechanism in the core density dependence theory – has a tendency to shift to focused rivalry or direct competition between specific actors, commonly those businesses pursuing similar strategies.[97] This propensity towards intensified head-to-head competition between large incumbent producers in the Swedish brewing industry became evident in the decades following World War II – as well as in several other economies.[98] Therefore, the theory of resurgence maintains that improvements in entrepreneurial opportunity will emerge when the processes of low

population density and strong constitutive legitimation of the industry are combined. Several empirical studies on different organisational populations have found support for this argument,[99] and this dynamic relationship also endogenously shapes the possibilities for various forms of micro-structure to develop over time.[100] In Sweden, as well as in several other economies, it was predominantly the proliferation of small, micro-breweries that constituted the increase in the population of breweries at a mature industrial stage (section three).

Can the analytical framework presented above, focusing on population-endogenous processes, serve as an explanation for changes and variation in entrepreneurship in the Swedish brewing industry – or are accounts and conceptions generated in past empirical research more reasonable explanations for the observed changes in entrepreneurship? The preliminary assumption in the present article is that the two views may be complementary. More specifically, it is hard to maintain that the propensity to found a business in the industry has remained unaffected by changes in the exogenous environment of the industry. At the same time, and as discussed, the trajectory of entry rates across time suggests a number of inconsistencies that do not entirely correspond to earlier accounts. By modelling entry rates, and by taking into account exogenous as well as endogenous conditions that relate to both the supply- and demand-sides of the industry, it becomes possible to generate a more comprehensive explanation for longer changes in entrepreneurship.

4.2. Analytical model and statistical results

In this section, a statistical analysis of business entry in the Swedish brewing industry is carried out, using empirical indicators that measure both endogenous and exogenous conditions. All data in the study relate to calendar years. It can be recalled that, in the ecology framework, variables that measure variation in exogenous conditions can be either general or specific to the industrial population. Ecological studies regularly control for macro conditions that are general for business activity – e.g. periods of stability, economic growth and affluence generally increase the opportunity for entrepreneurs.[101] Exogenous conditions that are specific to the industrial population and thus for rates of entry and exit – 'task environments' – commonly measure changes in product demand or industry output.[102] In his studies of the US brewing and wine industries, Swaminathan hypothesises that business entry rates are likely to be higher when the carrying capacity of the industry's environment is greater.[103,104] Another category of exogenous industry-specific variables in the ecology literature relates to institutional conditions; one example is the American brewing industry, for which the prohibition years between 1920 and 1933 represented an abnormal institutional period that distinctly affected the propensity to form a business in brewing.[105]

In the following analysis, and in line with past research, two macro-economic indicators, GDP per capita and the inflation rate, are included as controls.[106] Furthermore, I employ dummy variables (0,1) for five different institutional periods between 1830 and 2012: 1830–1864, 1865–1916, 1917–1955, 1956–1994 and 1995–2012. The indicators are regarded as exogenous and specific for the industrial population,[107] and they relate to earlier accounts of structural changes in the Swedish brewing industry. The years between 1917 and 1955, and the period from 1995 to 2012 (marking the Swedish EU membership), are considered to have changed the rules of the game. Similarly, decartelisation, increasing competition and rising economies of scale from the mid-1950s in the industry (1956–1994) have been held as explanations for falling entry rates in earlier research (as well in economic theory).

From the Decree of Freedom of Trade in 1865, the brewing industry became practically 'unregulated' and exempt from taxation, and the first years of the 1900s have been viewed as the peak of the founder period in Swedish brewing – consequently, past research suggests that this period was substantially different from the 1917–1955 period. The beer cartel was formed in 1906, but cartelisation may initially have spurred business entry; furthermore, even if regulations and taxation were imposed from the late 1800s, it seems more plausible that the combination of cartelisation and stricter regulations in 1917–1955 should reveal a more distinct negative effect on the propensity to enter into the trade.

I also include a measure of per capita beer consumption. The variable aims at measuring variation in demand-side conditions specific to the industrial population. Data are available from 1856, and I have combined different sources in order to calculate long comprehensive series of per capita beer consumption.[108] This gives two samples in the analysis: one full sample (1830–2012), and one 'restricted' sample, 1857–2012 (the restricted sample starts in 1857 since all independents are lagged one year). Beer consumption is linearly increasing over the entire 1857–2012 period, but there is a substantial variation around the trend. Table 1 reports the average per capita beer consumption at different intervals between 1856 and 2012 (2012 = 100). As can be observed, beer consumption increased up until the first years of the twentieth century, and fell to relatively lower levels between approximately 1910 and 1950. This relative decline can probably be explained by several factors, such as the institutional restrictions 1917–1955 and the two World Wars. An increasing trend from the 1950s is discernible, with noticeable increases in consumption in the 1970s and 1990s.[109]

It can be recalled that in the ecological framework, endogenous, supply-side changes are held as robust explanations for the variation in entry and exit rates. In the analysis, population density is a key endogenous variable. Following established procedures in previous ecological research, I make use of several interaction terms (product terms) between two key variables: population density and the age of the industry. These are indicators intended to capture the predicted effects from both the density dependence theory and the resurgence hypothesis. In line with the core density theory, population density is predicted to have an inverted U-shaped effect on entry – the variable *Density* should therefore reveal a positive relationship with entry, while its squared term ($Density_{sq}$) should reveal a negative relationship, rendering support for the theory of density dependence. In its 'infancy', a growing population is considered to signal opportunities for potential entrepreneurs. When the industry eventually gets crowded, the process of diffuse competition for finite resources for sustaining all firms in the population is predicted to depress the rates of entry.[110]

The variable *Industry age* is a time-clock, representing the process through which organisational processes become structurally institutionalised and the accumulation of organisational knowledge.[111] The variable is also used as a control for potential secular movements in entry rates and for addressing the temporal heterogeneity explanation in the analysis: to

Table 1. Index, average per capita beer consumption in Sweden during different periods, 1856–2012 (2012 = 100).

1856–1869	*1870–1879*	*1880–1889*	*1890–1899*	*1900–1909*	*1910–1919*	*1920–1929*	*1930–1939*
30.8	42.1	56.2	78.8	87.5	57.1	61.7	60.9
1940–1949	*1950–1959*	*1960–1969*	*1970–1979*	*1980–1989*	*1990–1999*	*2000–2009*	*2010–2012*
55.2	70.2	84.5	111.2	98.3	122.3	107.4	100.9

Sources: Statistics Sweden, *Statistical Yearbook* (various issues), *Historisk statistik för Sverige, Befolkningsutvecklingen under 250 år* and 'Population by region, marital status, age and sex. Year 1968–2014'; Swedish Board of Agriculture, 'Konsumtion av livsmedel'. Author's calculations.

deal with the assumption of decreasing dependence of legitimation and competition over the life cycle of the industry, I specify four interaction terms between the linear/squared terms of density and the time-clock, respectively (*Density* × *Industry age*; *Density* × *Industry age*$_{sq}$; *Density*$_{sq}$ × *Industry age*; *Density*$_{sq}$ × *Industry age*$_{sq}$).[112] It is expected that the four interactions will generate coefficients in a direction opposite to the one predicted for the 'main' effects from population density on entry – in order, a negative; a positive; a positive and a negative effect. This would render support for the conception in organisational ecology that the overall effects from legitimation and competition decline as industries age and that mature, consolidated industries may spur new entry activities.[113]

The dependent variable in the analysis is the number of business entries in each individual year between 1830 and 2012. Entries follow a counting process in which each individual business founding is treated as an event or transition at a specific point in time. Event-count models constitute the conventional procedure in the organisational ecology literature when analysing entry when the dependent variable consists of values that cannot be smaller than zero. Dates of entry typically only record the calendar year: there is usually no information on the precise durations between entry events that occur within the same interval or the ordering of entry events within one specific interval. This is also the case in the present article, and I employ a negative binomial regression model. This type of model is commonly used when data is over-dispersed (several observations with zero counts).[114] The analysis consists of seven models, reported in Table 2. In order to analyse entry rates from a causal perspective, all independent variables are lagged one year (t_{-1}). Models I-VI analyse the 1830–2012 period, while Model VII includes per capita beer consumption and therefore analyses the variation in business entry rates between 1857 and 2012.

Model I includes the two variables for exogenous macro conditions, GDP and the inflation rate, and the density variables (Table 2). GDP has a positive and statistically significant effect on the business entry rate; increases in aggregate demand elevated the entry rates. Inflation shows a negative effect on business entry, implying that periods of price stability had a positive effect on the entry rate. The presumed effect from density is not consistent – the squared term for density is, as expected, negative but not significant. Model II therefore adds the variable *Industry age*, which has a significant, negative effect – as the industrial population matured, entry rates generally fell. Furthermore, in Model II, the effect from density becomes significant, which can be interpreted as legitimation of the population initially having a positive effect on entry; however, crowding in the population – increasing competition – eventually depressed the entry rates. The inclusion of the time-clock therefore adds significantly to the analysis.

Model III addresses the potential effects from institutional periods. The reference period is 1865–1917 and is therefore excluded from the analysis. It can be observed that the assumption of density dependence is confirmed in Model III. Furthermore, significant effects from the five institutional periods are noticeable. In comparison to the reference period, and when controlling for the density dependence explanation, it can be noted that the conditions of the previous period (1830–1864) had a moderately positive effect on entry. The three other periods (1917–1955; 1956–1994; 1995–2012) all show significantly negative effects on the rate of business entry. Therefore, in general, this particular model suggests that the propensity to enter the Swedish brewing industry was affected by institutional conditions and institutional change. It can also be noted that the strongest negative effect is found for the period 1917–1955.

Table 2. Business entry in the Swedish brewing industry, 1830–2012 and 1857–2012. Negative binomial regression.

	1830–2012						*1857–2012*
	I	II	III	IV	V	VI	VII
Constant	−0.4626	0.1811	−1.6650**	−1.5548**	−1.1623*	−1.7813**	−5.8940*
	(0.347)	(0.270)	(0.627)	(0.422)	(0.593)	(0.569)	(3.002)
GDP per capita	0.0001**	0.0020**	0.0009**	−0.0005	0.0016**	−0.0004	−0.0002
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Inflation rate	−0.0572**	−0.0143	−0.0267	−0.0028	−0.0179	−0.0036	0.0061
	(0.021)	(0.015)	(0.018)	(0.014)	(0.016)	(0.014)	(0.015)
Density	0.0162**	0.0305**	0.0333**	0.1218**	0.0414**	0.1188**	0.1833**
	(0.006)	(0.004)	(0.007)	(0.017)	(0.007)	(0.023)	(0.060)
$Density_{sq}$	−0.0303	−0.0495**	−0.0893**	−0.3752**	−0.0850**	−0.3447**	−0.6189**
	(0.023)	(0.017)	(0.021)	(0.118)	(0.020)	(0.168)	(0.264)
Industry age (1830 = 1)		−0.0540**		0.0105	−0.0419**	0.0235	0.0233
		(0.005)		(0.008)	(0.012)	(0.017)	(0.031)
Period 1830–1864			1.0515**		0.8449**	0.1193	0.4227
			(0.417)		(0.386)	(0.360)	(0.455)
Period 1865–1916 (omitted)							
Period 1917–1955			−3.0723**		−0.9355	−0.6045	0.0778
			(0.438)		(0.750)	(1.047)	(1.045)
Period 1956–1994			−2.5531**		0.7379	−1.8295	−1.2078
			(0.934		(1.329)	(1.528)	(1.605)
Period 1995–2012			−2.5793**		0.4146	−2.3467	−1.7058
			(1.252)		(1.490)	(1.608)	(1.658)
Density × Industry age				−0.0031**		−0.0032**	−0.0036**
				(0.000)		(0.000)	(0.001)
Density × $Industry\ age_{sq}$				0.0171**		0.0179**	0.0180**
				(0.002)		(0.003)	(0.004)
$Density_{sq}$ × Industry age				0.0126**		0.0127**	0.0145**
				(0.002)		(0.003)	(0.005)
$Density_{sq}$ × $Industry\ age_{sq}$				−0.0805**		−0.0826**	−0.0842**
				(0.019)		(0.026)	(0.030)
Per capita consumption							0.0493**
							(0.021)
Alpha†	1.344**	0.413**	0.457**	0.116**	0.342**	0.114**	0.134**
Chi-square (d.f.)	37.68 (4)	144.38 (5)	147.43 (8)	200.86 (9)	156.44 (9)	204.01 (13)	188.52 (14)
Log likelihood	−361.72	−308.37	−306.84	−280.13	−302.34	−278.55	−237.02
N observations	183	183	183	183	183	183	156

Standard errors in parentheses.
*$p < 0.10$; **$p < 0.5$; †Dispersion parameter: if significantly greater than zero, data is better estimated using a negative binomial model.

Model IV differs in several ways from Model III and is specifically used for testing the resurgence hypothesis. Thus, it is similar to Model II but adds the four variants of interactions between population density and the time-clock. It does not include the institutional dummy variables. The model lends support to the 'core' theory of density dependence and to the resurgence hypothesis: as can be observed in Model IV, the coefficients for the four interaction terms are significant and they display the expected directions: negative; positive; and positive and negative. Consequently, and assuming that changes in entry activities reflect changes in entrepreneurial opportunity, the notion that business entries will increase when the processes of low population density and strong constitutive legitimation of the industry are combined, receives support.

In Model IV, we return to the question of potential institutional effects. Model III specifically excluded the time-trend variable (*Industry age*), but Model IV adds this variable to the analysis since there is a possibility that the dummy variables are picking up secular movements in

business entries.[115] If that were to be the case, the time-trend variable should reveal a negative, significant effect, and the dummy variables should display non-significant coefficients (washed out by the time-trend). Furthermore, the fit of Model V should also improve over Model III. As it turns out, this is generally the case: the time trend is statistically significant and negative. Furthermore, and except for the first period (1830–1864), all other periods become insignificant. Thus, according to Model IV, it appears that the different institutional periods were generally picking up the effect from secular movements in business entries. In that respect, the assumption that different institutional conditions affected the long-term propensity to found a business in brewing receives weaker support. At the same time, and as in Model III, Model V confirms the density dependence explanation.

Finally, Models VI and VII merge the dummies for institutional periods as well as the density dependence and resurgence variables/interactions into one single analysis; Model VII furthermore adds the variable used for testing the assumption of exogenous variation in the environment specific to the industrial population, represented by the demand for beer (per capita consumption, 1856–2012). Model VI reveals that the density dependence explanation and the resurgence hypothesis are supported, but none of the period dummies are significant. In that sense, Model VI (but also Model IV) gives evidence for the notion that longer endogenous changes in the structure of an industrial population have robust effects on entry rates. The results show that the resurgence in entry rates – mainly consisting of micro-breweries – increased when the industry had reached a mature stage, characterised by substantial concentration and consolidation. Furthermore, in Model VII, it can be observed that per capita beer consumption reports a positive, significant effect on entry rates: changes in demand for malt beverages generally signalled changes in entrepreneurial opportunity in the industry, thus intensifying the entry rate when demand was increasing.[116] This variable measures changes in exogenous, industry-specific conditions, and Model VII thereby shows that both endogenous and exogenous changes can be linked to variations in entrepreneurship across time.

In sum, the different models in the statistical analysis give support to the assumption that longer changes in the structure of the Swedish brewing industry affected the propensity for entrepreneurs to enter the trade. The density dependence and resurgence explanations, respectively, generally receive support (Models I–II; IV; VI). These are endogenous, supply-side explanations that, in essence, claim that entrepreneurial opportunities arise due to changes in the organisational population. Conditions exogenous to the industrial population – demand-side conditions – were also influential on entry behaviour; the variation in consumer demand for beer had a positive relationship with business entry (Model VII). Other population-specific, exogenous conditions received partial support, but the influence from the different institutional periods lessened when controlling for the gradual maturation of the industry, implicitly measuring the accumulated stock of organisational knowledge and increasing legitimation of the industry (Models III and V). When including all variables simultaneously (Models VI and VII), the effects from institutional periods vanish while the variables that are intended to capture the endogenous processes of density dependence and industrial resurgence, and changes in demand (an exogenous condition), remain.

5. Conclusion and discussion

Both the empirical description and the statistical analysis in this article concern changes in business entry activity over an extended period of time. Population-endogenous changes

have been linked to changes in the propensity for entrepreneurs to enter the industry; furthermore, the analysis has shown that exogenously determined supply- and demand-side factors could be linked to changes in entrepreneurship in the industry. However, the influence from exogenous conditions was generally less consistent. It was only to some extent that various period-specific institutional and economic conditions could be associated with variations in business entry. Drawing on past analyses, the article identified five different periods, but these periods showed less robust effects when controlling for endogenous variation in industry structure. Thus, the changes in business conditions from, e.g. the late 1910s, from the mid-1950s, or from the mid-1990s, could not be consistently linked to variations in business entry. However, from an analytical point of view, it is important to separate short-run conditions from long-run conditions. To claim that exogenous institutional conditions have *not* affected new venturing activity in the Swedish brewing trade would probably be an oversimplification – it is, for example, likely that the institutional and economic setting for (prospective) entrepreneurs in the present day differs quite substantially from the framework of the interwar period. Furthermore, other structures in the brewing industry of our time – e.g. conditions for financing; transaction costs and production costs; technology – are doubtlessly different from the conditions of the interwar years. From a shorter time perspective, it is therefore plausible that the propensity to start a business will be affected by prevailing period-specific conditions – the formal rule of concession initiated in the late 1910s is an obvious case. Furthermore, changes in the exogenous, population-specific environment clearly *did* affect the business entry behaviour: the variation in demand for beer showed a positive link to changes in entrepreneurship. Naturally, this observation could be regarded as quite self-evident: if demand falls, fewer firms will be prone to enter since it signals decreasing opportunity; if demand increases, it is likely that more entrepreneurs will enter.

Yet, these results are in accordance with the systemic, ecological literature that has been used as analytical framework in this study: rates of founding (and, in essence, the very existence of the industrial population) are dependent on processes that are both endogenous and exogenous.[117] The analysis demonstrates that changes in both supply-side endogenous structures and changes in exogenous demand-side conditions independently affected the long-run variation in the propensity to enter the Swedish brewing industry. However, in the long-term, endogenous structural changes across time were once more affecting rates of entry more consistently. It is equally possible that the new set of conditions from the mid-1950s strengthened the tendency towards competition and concentration. But the consolidation process – here measured as changes in the number of business firms in the industry – was extended and it had commenced already in the early twentieth century. This article points towards the fact that it was primarily this type of process – supply-side endogenous changes – that affected the longer fall in business entries. A similar interpretation can be made for the conditions in the 1865–1917 period, as well as for the new set of conditions from the mid-1990s. In the latter case, the proliferation of new breweries began around one decade earlier, under considerable concentration (which is still characteristic for the industry). Various economic and institutional settings over time may have reinforced or weakened the entry rate trend; however, consistent with the organisational ecology framework – and with the results in this article – they were perhaps not the primary drivers of changes in business entry. According to the density dependence explanation, the core theory in the organisational ecology literature, a new organisational form and a young industrial population initially

need to gain legitimation from the environment. Once accepted, the number of firms increases – firms entering in the very early history of the population have contributed to the process of legitimation and later entrants immediately gain legitimation. This is why, at some point, an industrial population often increases in numbers at a faster pace; entrepreneurs recognise the viability of the industry. Legitimation will eventually be replaced by the other major process, diffuse competition. At this stage, resources for sustaining the industrial population become increasingly exhausted, leading to increases in rates of exit and decreases in rates of entry. Thus, over longer observation periods, the relationship between entry and exit rates changes; these processes drive the industry towards concentration, consolidation, and oligopoly.

As proposed by the theory of temporal heterogeneity, however, the original density dependence theory has been less apt at explaining secondary increases in entrepreneurship. According to this theory, a fall in density of a mature population should not affect its legitimation; structures around the industry have evolved over time, such as formal rules and laws, supply-chains, or demand. Concentration, price competition and wars of attrition became characteristic for the Swedish brewing industry from the end of World War II. For several decades, the rate of exit substantially surpassed the number of new firms and a handful of large, long-standing breweries became increasingly dominant. However, the entry rates once more started to increase in the late 1980s. Admittedly, these increases were initially moderate, but viewed from a longer perspective, these first new breweries marked the onset of a new 'phase' in the trade, consisting of the rise of a new organisational form – the micro-brewery. Even though most micro-breweries have very small shares on the market, they now dominate the industry's organisational landscape. Opposed to established predictions in economic analyses, the organisational ecology literature proposes that industrial populations exhibit renaissance not in spite of, but as a result of, concentrated markets dominated by a few large businesses.[118] The organisational ecology literature therefore maintains that the entry rates will increase when concentration and consolidation are combined with strong legitimation of the industry.[119] Not all kinds of industries will necessarily display a resurgence or proliferation of specialist organisations (in some industries, new entrants can consist of large, established firms from other industries),[120] but this movement has been empirically observed in several different industrial populations, including brewing.[121] Indeed, the Swedish brewing trade has been constitutively legitimated since at least the late 1800s, and intensified competition and concentration from the end of World War II is well-documented in past analyses – as is the pattern of resurgence in business entry, starting around 30 years ago.[122] Interpreted through the lens of the resurgence hypothesis, a long process of increasing rivalry between large breweries eventually opened up pockets of unused resources, leading to the spread of new, small breweries in Sweden. This process was extended, and in order to come to these conclusions, one must therefore consider the industry's development over a long period of time.

As noted in passing, the results in the present article give less support for other previously generated accounts that have focused on other explanations and that have studied relatively shorter periods. The systems-approach to changes in entrepreneurship in Swedish brewing in this article places more weight on endogenous population dynamics than on external (historical) events: the longer systemic trends of entrepreneurship that have been identified in this study were, in general, less affected by comparatively 'shorter' exogenous changes in the economic and institutional framework of the industry. It should be noted that earlier

empirical research on the Swedish brewing trade has generally not had the specific objective to explain variation in business entry rates over longer intervals. But past research – often using aggregated data on plants over shorter intervals – has claimed that the overall business structure of Swedish brewing evolved in accordance with period-specific exogenous conditions. In this study, however, changes in venturing activity did not always correspond to previously identified explanations – neither by graphic inspection nor in the statistical analysis. Population studies on business entry in other brewing industries, and on other industries, have found that contemporaneous idiosyncrasies do not always alter the long-run trend of business entry, or that the timing of previously generated explanations is not always synchronised with changes in entry behaviour.[123] This article has identified similar mechanisms; accordingly, past generated explanations may be reasonable – but if so, only partially. Additionally, prior accounts of the recent proliferation of micro-breweries in Sweden have not been entirely consistent. Several different causes, relating to both changes in supply- and demand-side conditions and to institutional change, have been put forward; however, analyses that formally test different explanations do not exist. Alternative data and a longer time-frame can therefore produce novel results and they can generate alternative interpretations of both past and present processes. In this article, I have attempted to structure, and separate, supply-side and demand-side explanations and hypothesise on different accounts from established literatures and past empirical research. In line with recent discussion in business history, and using the case of the Swedish brewing industry, the present article has tried to explain both how and why entrepreneurship changes over time.[124]

The word 'mechanism' suggests absence of agency. Admittedly, the methodological approach of this article risks emphasising universal and immanent forces which will reduce how individual, strategic action influences organisations. Furthermore, another obvious disadvantage with this type of research strategy is the lack of detail.[125] In this study, all business organisations in the industry have been treated as 'equal.' Thus, differences in, e.g. geography, strategy, growth, or scale or scope between individual breweries or various categories of breweries, have neither been specifically included nor controlled for in the analysis. Instead, a certain number of new business firms simply enter (or not) at a specific point in time, and this may be the most extensive problem with this approach. In spite of this, it is inevitable that the shape of the Swedish brewing industry that can be observed today was affected by events in the past, of which several were endogenous to the industry. These events shaped the long-term evolution of the industry and therefore, they affected the long-term variation in business entry. This might be the key advantage of a research approach that addresses the complete organisational history of a particular industry – previous organisational failures and successes that were parts of the industry were also parts in the shaping of subsequent and present-day structures.

The approach would make it possible for business historians to differentiate temporal domains of the history of an industry: longer processes of legitimation in an evolving industry; maturation and persistence of an industrial population (e.g. institutionalisation); processes of competition and consolidation; periods of shakeouts and possible resurgence – and to distinguish the roles played by exogenous and endogenous conditions. Not only organisational ecology but also other literatures have identified regularities and patterns in the longer development of industrial populations; these concepts and hypotheses could serve as useful frameworks for business historians.[126] Case studies may benefit from a framework that theorises on the implications from both exogenous and endogenous changes,

and on how changes in the organisational landscape of the industry affect changes in competition and structure; for instance, what do changes in business entry and exit in the industry periods imply for the individual business? Similarly, researchers that study industries and industrial change over more limited periods can recognise that some processes of change, regardless if they are determined endogenously or exogenously, may take place over rather long intervals and that there may be competing or complementing interpretations – at different levels of analysis.

In this article, I have not considered other potential explanations for business entry in the Swedish brewing industry, such as technological change. For example, we may think of the introduction of Bavarian Beer in the 1840s as an exogenous technological event (or innovation) with effects on both incumbent breweries and entrepreneurial propensity. Future analyses of these unique data could clarify the potential role of both technological change and other conditions in the socio-economic environment. Future analyses should also elaborate more in detail on how the opportunity for business entry is shaped by institutional conditions, including short- and long-run changes in policy regimes (e.g. liberalisation), and on how the strategies and behaviour of both individual breweries and business groups may have affected business entry across time. There is also a potential to make comparative studies with other economies. Furthermore, variations in business *exits* in the industry would also be an important topic for future analyses.

Notes

1. Caves, "Industrial Organization"; Carroll and Hannan, *The Demography of Corporations*.
2. Hannan, "Inertia, Density"; Ruef, "For Whom the Bell."
3. For example in the US (e.g. Carroll and Swaminathan, "Why the Microbrewery Movement?"); in the UK and in England (Cabras and Bamforth, "From Reviving Tradition"; Swann, "The Fall and Rise"), in Canada (Lamertz et al., "New Identities") and in the Czech Republic (Maier, "Selected Aspects").
4. Shane, *A General Theory*.
5. See for example Landes, *Dynasties*. For a recent case study on entrepreneurial opportunity in business history, see Popp and Holt, "The Presence."
6. Martinez, Yang and Aldrich, "Entrepreneurship."
7. Garnett, Mollan and Bentley, "Complexity in History."
8. For further examples, see Gratzer, *Snabbmat i automat*; Eriksson and Stanfors, "A Winning Strategy?"
9. Jones, van Leeuwen and Broadberry, "The Future." See also Friedman and Jones, "Business History."
10. Carroll and Khessina, "The Ecology of Entrepreneurship"; Gartner and Shane, "Measuring Entrepreneurship"; Shane, *A General Theory*.
11. Jones et al., "The Future."
12. Martinez et al., "Entrepreneurship"; de Jong, Higgins, and van Driel, "Towards a New," 22–23.
13. Foreman-Peck, "Measuring Historical Entrepreneurship."
14. Shane, *A General Theory*, 18–35.
15. Carroll and Khessina, "The Ecology of Entrepreneurship"; Carroll and Hannan, *The Demography of Corporations*; Geroski, "Exploring the Niche Overlaps."
16. Reed, "Organizational Theorizing," 33.
17. de Jong et al., "Towards a New."
18. Eriksson and Stanfors, "A Winning Strategy?"; Garnett et al., "Complexity in History."
19. Baum and Shipilov, "Ecological Approaches"; Garnett et al., "Complexity in History."

20. As Jones and Wadhwani point out, historical path dependence helps to understand how entrepreneurship is constrained or enabled by previous choices and developments at the firm and industry level. A cross-sectional (or short time) perspective is unable to identify these factors; Jones and Wadhwani, "Schumpeter's Plea," 25. See also Jones and Wadhwani, "Entrepreneurship and Business History."
21. See, for example, Bring, *S:t Eriks bryggeri*; Hellström, *Med öl i blodet*; Wigstrand, *Dryckesbröder*.
22. Attman, Bryggerinäringen i Göteborg, Thunaeus, *Ölets historia i Sverige*; Hamberg, *Svensk bryggeriindustri*.
23. The most recent analyses are the thorough studies by Eriksson, *Branschinteraktion*; Lundqvist, *Den stora ölkartellen*; Sandberg, *Kartellen som sprängdes*.
24. See as an example Ekström and Sundström, *Dryckeskonsumtionen i Sverige*; Anell and Persson, *Historien om det privata*.
25. The Swedish alcohol policy and governmental regulations have been intensely disputed ever since the introduction of the first substantial regulations in the early twentieth century.
26. Aggregated information on net variation may present a 'stable' population that changes only to a little extent, or not at all, between two points in time. But this does not mean that the number of births and deaths – gross changes – cannot vary: if births (entries) and deaths (exits) increase at exactly the same rate, no matter how low or high, the net change of the population becomes exactly zero.
27. Thunaeus, *Ölets historia i Sverige*.
28. Sveriges bryggmästare förening/Svenska bryggareföreningen, *Bryggerier och mälterier*.
29. In particular, it has not previously been used for systematic analyses of the evolution of the Swedish brewing industry, neither has it been used for specific analyses of entry and exit rates. Lundqvist, *Den stora ölkartellen*, and Sandberg, *Kartellen som sprängdes*, make partial use of the data in SBF.
30. Several breweries either specialised solely in Small Beer or had a combined production. In 1905, 876 rural, small breweries and 240 'real' industrial-type breweries produced this beverage (plant level); Lundqvist, *Den stora ölkartellen*.
31. Long into the 1800s, brewing was combined with distilling of spirits: Thunaeus, *Ölets historia i Sverige*, 161–166. Sources from the early nineteenth century hardly ever report any brewery of equal importance to the factories or mills in other industries; see for example Kommerskollegium, *Commerce-collegii underdåniga Berättelse*, 9.
32. This research is: Eriksson, *Branschinteraktion*; Lundqvist, *Den stora ölkartellen*; Lundqvist, "The Making" and "Bryggerierna och ölmarknaden"; Nilsson, *Bryggeribyggnader* and *Bryggerier i Sverige*; Sandberg, *Kartellen som sprängdes*, "Tingsryds bryggeri" and "The Creation." Eriksson makes a significant (and to my knowledge the only previous) attempt to map new organisations in Swedish brewing, 1990–2000.
33. Lists are provided by Sveriges Bryggerier and Föreningen Sveriges Oberoende Småbryggerier. The business databases are *Orbis*, *Zephyr*, and *Retriever Business*. The use of industry codes may cause validity problems; several brewing firms are not classified as breweries. This discrepancy is very obvious in the present case: several breweries use codes such as 'Wholesale of Beverages', even though they in practice primarily *manufacture* beer and define their business as a brewery. For a methodological discussion, see Stokes and Banken, "Constructing an 'Industry'."
34. The media database *Retriever Research* was intensely employed, using various (combined) search terms. Several articles in media cover news on entries and exits of breweries, some with complete lists; see articles in *Dagens Nyheter*, August 24, 1998, and in *Nya Ludvika Tidning*, October 24, 2002. See also Jernström, *Sveriges ölbryggerier*.
35. In their study of the US micro-brewery movement, Carroll and Swaminathan ("Why the Microbrewery Movement?") used this strategy. See also Kroezen, *The Renewal*, for a similar approach to the Dutch brewing trade. In my own attempts, the website "Sveriges mikrobryggerier" provided useful contemporary data. Similarly, "Humleriket" (http://humleriket.blogspot.se/p/svensk-bryggerihistoria.html) and "Nisses Ölsidor" (http://home.swipnet.se/pistora.4), a blog/webpage active between 1997 and 2002, disclosed valuable information.

36. Hamberg, *Svensk bryggeriindustri*; Thunaeus, *Ölets historia i Sverige*.
37. SBF, *Bryggerier och mälterier i Sverige*, 110; Blom, "Tyskarna som industrialiserade"; Gerger, "Åbro bryggeri i Vimmerby."
38. Lundqvist, *Den stora ölkartellen*; Hamberg, Svensk bryggeriindustri.
39. Lundqvist, "The Making."
40. Lundqvist, *Den stora ölkartellen* and "The Making."
41. New types of financial actors entered as credit creators and intermediaries, involving in a number of industries, including brewing; Broberg, *Konsten att skapa*.
42. Both distribution and import of Class III beer were formally prohibited in 1923; however, in reality, stronger brews had not been produced since World War I (1914–1918). A classification of beer according to its volume of alcohol was introduced in 1919, resulting in a definition of specific classes of beer based on their alcohol content: Classes I, II, and III, and the latter class was formally defined as an intoxicant (the classifications are still used today). See Sandberg, *Kartellen som sprängdes* and "The Creation"; Lundqvist, "Bryggerierna och ölmarknaden" and "Den starka alkoholstatens fall."
43. Sandberg, "The Pressure."
44. Anell and Persson, *Historien om det privata*; Sandberg, "The Creation."
45. Privatisation of state enterprises and welfare-related activities increased in Sweden during the 1980s and 1990s; Gratzer, Lönnborg, and Olsson, "Statligt företagsägande och privatisering."
46. For an overview, see Lundqvist, "Den starka alkoholstatens fall."
47. For a description of the new distribution system, see Sandberg, "Tingsryds bryggeri"; for the distribution system of our time, see Eriksson, *Branschinteraktion*, and an article in *Dagens Nyheter*, August 24, 1998.
48. Lundqvist, *Den stora ölkartellen* and "The Making."
49. See Gabrielsson, *Koncentration och skalekonomi*; Sandberg, *Kartellen som sprängdes* and "The Creation." The total production of Class II and Class III beer amounted to approximately 30 million litres in 1935, produced by 107 breweries. In 1955, the remaining 62 breweries in the industry produced 53 million litres. By 1975, the industry consisted of 23 breweries producing 82 million litres (own calculations).
50. Anell and Bonnedahl, "The Impact"; Anell and Persson, *Historien om det privata*; Sandberg, "The Creation."
51. Sandberg, *Kartellen som sprängdes*; Sandberg, "Tingsryds bryggeri."
52. Anell and Persson, *Historien om det privata*; Hellström, *Med öl i blodet*.
53. The term micro-brewery should be viewed as a collective label. Commonly used and closely related terms are, e.g. 'craft breweries' or 'nano-breweries' (the latter being very small production units). No official definition exists in Sweden.
54. Systembolaget, "Systembolagets försäljning," figures for 2013. For an overall but short description of the brewing industry in recent times, see Anell and Bonnedahl, "The Impact." The industry association Brewers of Sweden (Sveriges Bryggerier) has in recent years been increasingly optimistic about the future of the industry in various press releases.
55. Carroll and Swaminathan, "The Organizational Ecology."
56. See Lundqvist, "The Making."
57. For a thorough study of the dissolution of the Beer cartel, see Sandberg, *Kartellen som sprängdes*.
58. Sandberg, "The Creation," 46.
59. Schröter, "Cartelization and Decartelization," 139–145.
60. See Chandler, *Scale and Scope*.
61. Lundqvist, "Bryggerierna och ölmarknaden"; Sandberg, *Kartellen som sprängdes*.
62. Dobbin and Dowd, "How Policy Shapes."
63. McEachern, *Economics*.
64. Sandberg, *Kartellen som sprängdes*.
65. Sandberg, "Tingsryds bryggeri."
66. Sundström and Ekström, *Dryckeskonsumtionen i Sverige*. See also Gabrielsson, *Koncentration och skalekonomi*; Sandberg, *Kartellen som sprängdes*.
67. For a contemporary analysis, see Anell and Persson, *Historien om det privata*.

68. Swedish Competition Authority, *Konkurrensförhållanden inom bryggerisektorn*.
69. See for instance articles in *Kollega*, June 17, 2015; *Smålandsposten*, September 17, 2014; *Nerikes Allehanda*, July 23, 2014.
70. Eriksson, *Branschinteraktion*, 201–208; Lundqvist, "Den starka alkoholstatens fall," 20. See also Tremblay and Tremblay, *The U.S. Brewing Industry*, 114–134, for a similar explanation to the rise of micro-breweries in the US.
71. Articles, *Dagens Nyheter*, August 24, 1998; *Sveriges Radio*, May 25, 2004; *Nya Ludvika Tidning*, October 24, 2002. See also Eriksson, *Branschinteraktion*, 241; Lundqvist, "Den starka alkoholstatens fall," 20–21.
72. Article, *Dagens Nyheter*, September 26, 2004.
73. See also Eriksson, *Branschinteraktion*, 91.
74. Ruef, "For Whom the Bell," 62–63.
75. Geroski, "Exploring the Niche Overlaps," 533.
76. Admittedly, this description may be too simplistic; see e.g. Cohen and Klepper, "Firm Size."
77. Agarwal and Gort, "The Evolution of Markets"; Klepper, "Firm Survival."
78. For a comprehensive overview, see Carroll and Hannan, *The Demography of Corporations*.
79. Hannan, "Inertia, Density"; Freeman, Larsen, and Lomi, "Why is there no Cannery"; Lomi, Larsen, and Freeman, "Things Change"; Lomi, Larsen, and Wezel, "Getting There"; Ruef, "For Whom the Bell."
80. Garnett et al., "Complexity in History."
81. Carroll and Khessina, "The Ecology of Entrepreneurship."
82. Carroll and Hannan, *The Demography of Corporations*, 59–76, 240. See also Baum and Shipilov, "Ecological Approaches."
83. Garnett et al., "Complexity in History"; Barnett and Amburgey, "Do Larger Organizations."
84. Carroll and Hannan, *The Demography of Corporations*, 225–227; Freeman, Lomi, and Larsen, "Why is There no Cannery."
85. Barron, "Organizational Ecology."
86. e.g. Baum and Shipilov, "Ecological Approaches"; Swaminathan and Wiedenmayer, "Does the Pattern."
87. Two examples are American labour unions (Hannan and Freeman, "The Ecology of Organizational Founding"), and the Swedish IT-industry (Zaring and Eriksson, "The Dynamics").
88. Carroll and Swaminathan, "Density Dependent Organizational Evolution"; Carroll and Swaminathan, "The Organizational Ecology"; Carroll and Wade, "Density Dependence."
89. Carroll et al., "Brewery and Brauerei"; Swaminathan and Wiedenmayer, "Does the Pattern."
90. See Hannan, "Inertia, Density," 204. Economic analyses would generally distinctly separate large, incumbent breweries (macro-brewers) from new and small breweries (micro-brewers) in the analysis; see Tremblay and Tremblay's comprehensive examination of the US brewing industry from the post-war period and onwards; Tremblay and Tremblay, *The U.S. Brewing Industry*.
91. Carroll and Hannan, *The Demography of Corporations*, 266; Carroll, Dobrev, and Swaminathan, "Organizational Processes," 2–3.
92. Eriksson, *Branschinteraktion*, 237–239.
93. Carroll and Swaminathan, "Why the Microbrewery Movement?" See also Carroll and Swaminathan, "The Organizational Ecology"; Swaminathan, "Entry into New Market Segments." See also Cabras and Bamforth, "From Reviving Tradition."
94. Hannan, "Inertia, Density." Hannan's resurgence hypothesis sets out from the resource partitioning explanation developed by Carroll, "Concentration and Specialization." See also Carroll and Hannan, *The Demography of Corporations*, 261–270.
95. Carroll and Hannan, *The Demography of Corporations*, 244–247.
96. Lindbom, *Femtio år*.
97. Hannan, "Inertia, Density," 203–204.
98. See Gabrielsson, *Koncentration och skalekonomi*; Müller and Schwalbach, "Structural Change"; Swann, "The Fall and Rise."
99. Dobrev, Ozdemir, and Teo, "The Ecological Interdependence"; Ruef, "For Whom the Bell"; Sorenson, "The Effect of Population-level Learning"; Wezel, "Location Dependence."

100. Carroll and Hannan, *The Demography of Corporations*, esp. 261. A number of explanations for the evolution of micro-structure and segregating processes have been suggested, including social construction explanations (see Carroll et al., "Organizational Processes," 28–29; Carroll and Swaminathan, "Why the Microbrewery Movement?"; Lamertz et al., "New Identities"). The different explanations often require several different empirical indicators: Baum and Shipilov, "Ecological Approaches." Carroll and Khessina ("The Ecology of Entrepreneurship") maintain that different explanations need not be mutually exclusive.
101. Carroll and Hannan, *The Demography of Corporations*; Swaminathan, "Resource Partitioning."
102. Similarly, economic analyses use trends and changes in consumer demand as a partial explanation for the recent rise of micro-breweries; e.g. Tremblay and Tremblay, *The U.S. Brewing Industry*.
103. Swaminathan, "The Proliferation" and "Entry into New Market." See also Carroll and Swaminathan, "Why the Microbrewery Movement?"
104. However, the results in ecological studies are not entirely consistent; see Swaminathan, "Entry into New Market." See also Delacroix, Swaminathan and Solt, "Density Dependence." In other ecological studies, the effects of consumer demand have been shown to be weaker; Carroll and Swaminathan, "The Organizational Ecology."
105. Carroll and Swaminathan elaborate on the effect of the US prohibition; "Density Dependent Organizational Evolution." Furthermore, in their study of the US and German brewing industries, Carroll et al. specifically control for the more overall potential effects from the two World Wars (Carroll et al., "Brewery and Brauerei").
106. GDP data is a GDP per capita index (fixed prices) expenditure approach. Data for the period 1830–2000: Edvinsson, *Growth, Accumulation, Crisis*. Data for the period 2001–2012, Statistics Sweden, "GDP: Expenditure Approach." Inflation is derived from Edvinsson and Söderberg, "The Evolution" (period 1830–2008); Statistics Sweden, "Inflation i Sverige" (period 2009–2012).
107. See Dobbin and Dowd, "How Policy Changes," and Hannan, *Inertia, Density*, for similar approaches.
108. I have used a variety of sources and several calculations for producing harmonised series (Table 1). To my knowledge, data for earlier periods does not exist. The series is an index of per capita consumption of all types of beer and all volumes of alcohol. Details are available upon request.
109. Generally, total per capita alcohol consumption in Sweden has risen ever since 1950 but in the long-run, the per capita consumption of sprits has fallen ever since the early 1860s. Consumption of beer and especially wine has crowded out consumption of spirits since the 1980s; CAN, "Drogutvecklingen i Sverige," 33.
110. See, for example, Carroll and Swaminathan, "Why the Microbrewery Movement?"; Carroll and Swaminathan, "The Organizational Ecology."
111. Hannan, "Inertia, Density."
112. Following the literature (e.g. Ruef, "For Whom the Bell"), the variable $Density_{sq}$ is specified as follows. If *Density* is D, and $Density_{sq}$ is D_{sq}, then D_{sq} is defined as $(D_{sq}/10^3)$. Furthermore, if t denotes *Industry age*, the four interaction terms are, in order, defined as $(D \times t)$; $(D \times t/10^3)$; $(D_{sq}/10^3 \times t)$, and $(D_{sq}/10^3 \times t/10^3)$.
113. Hannan, "Inertia, Density," see also Dobrev et al., "The Ecological Interdependence"; Ruef, "For Whom the Bell."
114. This specification implies a Poisson distribution of event counts. However, the Poisson model is inadequate for analyses of over-dispersed data; the negative binomial distribution overcomes this limitation. See Carroll and Hannan, *The Demography of Corporations*, 129–134. The zero-inflated negative binomial model is an alternative, but initial tests of the data (Vuong test) do not indicate that the zero-inflated model would be superior.
115. This approach is used by Dobbin and Dowd, "How Policy Shapes."
116. There is probably a complex relationship between some independents in Model VII since it is plausible that (changes in) institutional conditions affect changes in demand. This was most likely the case during the interwar years when the stricter rules coincided with a relative fall in beer consumption (Table 1). However, the variables show weak to moderate correlations, and I hold it as more realistic that, in the long-term, they generally reflect independent processes.

They do not appear to be systematic: for the entire 1830–2012 period, the correlation coefficient (r_{xy}) between per capita beer consumption is 0.806 (showing a positive trend); the coefficients for the five different period dummies are, in order: -0.414; -0.314; -0.291; 0.536, and 0.439.

117. Carroll and Swaminathan, "Why the Microbrewery Movement?"; Carroll et al., "Brewery and Brauerei"; Baum and Shipilov, "Ecological Approaches." More detailed and complex analyses of the dynamic relationship between a population and its environmental carrying capacity are possible. Freeman et al. ("Why is There no Cannery") have recently elaborated on this complex interplay, theorising on feedback mechanisms over time between the organisational population and its carrying capacity, where a population does not only consume but also generates resources for its sustenance.
118. Carroll and Swaminathan, "The Organizational Ecology" and "Why the Microbrewery Movement?"
119. In line with Hannan, "Inertia, Density." However, it should be pointed out that other measures of concentration (e.g., market shares) could produce different results. In this study, and in line with the literature in organisational ecology, I have used an 'indirect' measure of concentration: industrial density.
120. For a discussion, see Carroll et al., "Organizational Processes," 3. As an example, in the global mobile phone industry, large computer manufacturers such as Apple, HP and Acer, and software producers such as Microsoft, have recently introduced their own products; see Giachetti and Marchi, 'Evolution.'.
121. Carroll and Swaminathan, "Why the Microbrewery Movement?"
122. Anell and Persson, *Historien om det privata*; Sandberg, Kartellen som *sprängdes*; Eriksson, *Branschinteraktion*.
123. Carroll et al., "Brewery and Brauerei"; Swaminathan and Wiedenmayer, "Does the Pattern"; Garnett et al., "Complexity in History"; Ruef, "For Whom the Bell."
124. Jones, van Leeuwen and Broadberry, "The Future."
125. Reed, "Organizational Theorizing," 33.
126. See de Jong et al., "Towards a New."

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