Why the Microbrewery Movement? Organizational Dynamics of Resource Partitioning in the U.S. Brewing Industry[1]

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The number of small specialty brewers in the U.S. beer brewing industry has increased dramatically in recent decades, even as the market for beer became increasingly dominated by mass-production brewing companies. Using the resource-partitioning model of organizational ecology, this article shows that these two apparently contradictory trends are fundamentally interrelated. Hypotheses developed here refine the way scale competition among generalist organizations is modeled and improve the theoretical development of the sociological bases for the appeal of specialist organizations' products, especially those related to organizational identity. Evidence drawn from qualitative and quantitative research provides strong support for the theory. The article offers a brief discussion of the theoretical and substantive issues involved in application of the model to other industries and to other cultures.

INTRODUCTION

Although it passed without great fanfare, the year 1997 marked an organizational milestone of sorts for the United States. For the first time in

at least two centuries, the number of U.S. breweries exceeded that of Germany, the nation with the strongest brewing tradition (and still the country with the highest per capita consumption of beer). According to the Institute of Brewing Studies (1997, 1999), 1,273 breweries operated in the United States as of June 1997, while Germany was home to 1,234 breweries. By mid-1999, the number of American breweries had risen to 1,414.[2]

Considering that in 1983 only 43 brewing firms operated in the United States, the milestone reflects a remarkable period of industrial renewal. Innovation characterizes the renewal as much as organizational prolif-eration does. Nearly every one of the breweries founded in the last 20 years is associated in some way with the self-labeled "microbrewery" movement, a group of brewers and consumers concerned with crafts-manship and taste in brewing beer. Collectively, these breweries have introduced and reintroduced to the American market a wide variety of new malt beverage products. Individually, the breweries tend to be small and specialized in their product offerings and target markets.

What is behind the microbrewery movement? How can it be explained? Most economic analysts not only did not foresee the renewal; they pre-dicted the opposite—a continued contraction in firms. For example, in his classic book on competitive strategy, Porter (1980) cited the brewing industry to exemplify barriers to entry. He wrote that "in the brewing industry, product differentiation is coupled with economies of scale in production, marketing and distribution to create high barriers" (p. 9). Sociologists (e.g., Perrow 1986, pp. 211–13) also sometimes used such thinking when considering industries dominated by a few large firms. By contrast, after looking closely at certain highly concentrated industries (specifically music recording, newspaper publishing, book publishing), other organizational sociologists (Peterson and Berger 1975; Carroll 1985; Powell 1985) suggested that there could be organizational tensions driving these types of industries in the other direction. In fact, after uncovering such developments in the local newspaper industry, Carroll went so far as to conjecture in this journal that in the case of brewing "the U.S. market appears ready for an upsurge of specialist breweries" (1985, p. 1280).

[2] These figures count breweries, not brewing firms. In the analyses below, we use data we compiled on brewing firms, thus generating some differences between our counts and those reported by the Institute for Brewing Studies.

We address ourselves here to an understanding and analysis of the organizational dynamics behind the rise and proliferation of microbreweries. We report the findings of qualitative and quantitative research we have conducted on this industry over the last decade. The centerpiece of our efforts consists of a statistical analysis of the founding and mortality rates of all breweries ever to make or sell malt beverages in the United States from 1938 to the end of 1997. We base this analysis on a comprehensive data set we have compiled that contains records of the life histories of 2,251 breweries. However, we also draw significantly from a wide variety of unstructured qualitative research activities. These include interviews with industry participants (entrepreneurs, brewers, gatekeepers, and consumers), attendance at industry events (e.g., seminars/workshops, festivals, tasting events), site visits to production facilities, inspection of company promotional materials and advertisements, regular monitoring of industry periodicals, and the development of several case studies for instructional purposes (Barnett and Carroll 1995a, 1998).

Although the social and economic significance of beer should not be slighted, brewing does constitute but a single industry. Our goal in investigating this case is to develop organizational theory generally. Toward that end, we use the resource-partitioning model (Carroll 1985; Carroll and Hannan 1995; Péli and Noteboom 1999), an established model of organizational ecology. As explained below, resource-partitioning theory explains the rise of late-stage specialist segments within an industry as an (unexpected) outcome of the consolidation occurring among large generalist organizations as they compete for the largest consumer resource bases of the mass market. It has been used to understand organizational developments similar to microbreweries in a wide variety of disparate industries including (in addition to those mentioned above) auditing, banking, feature films, winemaking, telephone service, automobile manufacturing, airline passenger service, medical diagnostic imaging, and microprocessor design and manufacturing (we review the studies below).

The resource-partitioning model formed the basis for Carroll's (1985) conjecture about specialist breweries. We assess here its ability to account for the U.S. brewing industry as it actually developed over the contemporary period, which we define as beginning with the repeal of national prohibition and continuing to the near present. This assessment reveals some limitations of the model and of previous empirical research. Together with other recent work, it leads us to propose some significant theoretical revisions and extensions involving two major aspects of the theory. The first of these concerns scale competition among mass producers: we propose a model of scale-based selection that potentially has wide application outside the current theoretical context. The second concerns the mechanisms operating to produce resource partitioning: we propose that organ-

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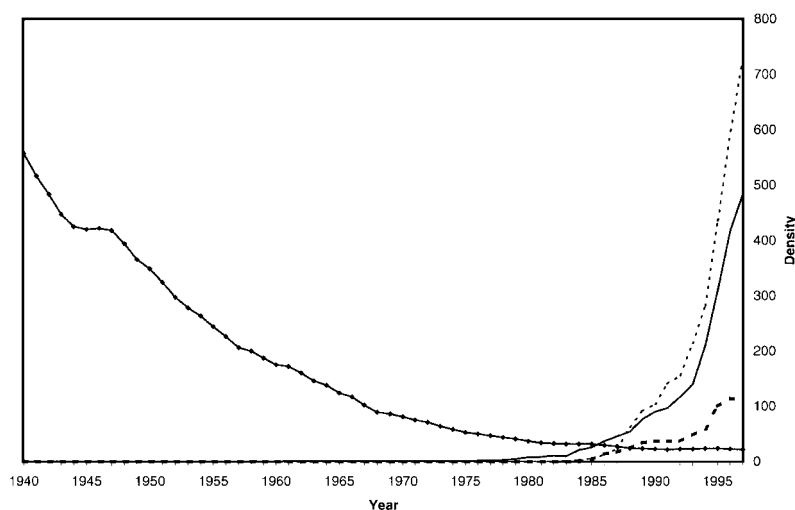
FIG. 1.—Density of beer firms by organizational form. Connected dots = mass producers; solid line = microbreweries; thin dotted line = brewpubs; heavy dashes = contract brewers.

izational form identity plays a major role in creating the specialist niche, and we develop new arguments based on this theoretical conjecture. We evaluate both proposals here with systematic tests. The findings from this analysis lead us to conclude that there is merit in the proposals. Moreover, in our view, these refinements not only make the model more rigorous and comprehensive, they also give the theory a much stronger sociological character as they incorporate cultural matters.

PARTITIONING IN ORGANIZATIONAL POPULATIONS

Signature Trends

Resource-partitioning theory addresses the interrelationship between two organizational trends. The first of these is the trend of increasing market concentration found in many industries, especially when the rise occurs gradually and over the long term. For instance, in the American beer industry the combined market share held by the four largest firms rises from under 10% in 1910 to over 80% in the 1990s. The second trend is the increasingly common appearance of many small specialist organizations in certain mature industries. Figure 1 illustrates this development in brewing, where the specialist organizations consist of those organizational forms associated with the microbrewery movement: micro-

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breweries, brewpubs, and contract brewers.[3] Resource-partitioning theory explains why the two trends sometimes occur simultaneously within the same industry.

Resources and Crowding

The theoretical imagery of resource partitioning relies on notions of crowding among organizations in a market characterized as a finite set of heterogeneous resources. Organizations initially attempt to find a viable position within this market by targeting their products to various resource segments. Specialist organizations choose narrow homogenous targets, while generalist organizations choose targets composed of heterogeneous segments.

It is essential to the theory that some aspect of product delivery in the market possesses a scale advantage; this is typically envisioned as a strong economy of scale in production, marketing, or distribution (Carroll 1985). Competition among generalist organizations in these markets consists of an escalating war for resources. Because of the increasing returns to scale, the most intense fighting occurs in the densest or most abundant resource areas. The generalist organization that secures a toehold in this dense market "center" possesses a potentially sustainable advantage over all competitors. Many generalists seek to establish themselves in this region. But because each originates from different locations and each seeks to maximize that part of its target without competitors, the set of competing generalists is somewhat differentiated. Larger generalists will eventually out-compete smaller ones, however. When the smaller generalists fail, their target markets become free resources. Generalists occupying adjacent regions hold the best positions for securing these newly available areas, and they typically are successful in doing so. The surviving generalist thus becomes larger and more general. However, because of the wide range of a generalist's target area, it is difficult to secure the entire free area; doing so might prove more costly than it is worth or entail loss of some of the firm's existing target area. This is especially the case in mature markets where generalists are very large and possess extremely broad target areas. So, as the competitive struggle among generalists proceeds

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[3] Following Pólos, Hannan, Péli, and Carroll (1998) and Pólos, Hannan, , and Carroll (1999, 2000), we conceptualize organizational forms generally as identities based on their socially coded properties rather than on only official classifications or structural architecture. Simply put, microbreweries are small-scale producers of ale and beer by traditional "hand-crafted" methods; brewpubs are small-scale producers of ale and beer by traditional "hand-crafted" methods who sell for consumption at the site of production (typically, a brewer-restaurant); and contract brewers are sellers of ale and beer made by other firms (usually marketed as though they were from a microbrewery).

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to its eventual monopoly equilibrium, the size and target breadth of the survivors increases, but the combined resources held by all generalist organizations declines somewhat (Carroll 1985; Carroll and Hannan 1995).

Specialist Viability

The main theoretical mechanism for explaining the rise of specialist firms involves the resource space that lies outside the generalist target areas. It is here, away from the intense competitive pressure of the dominant large generalists, that specialist organizations can find viable locations (Carroll 1985). And because resources tend to be thin in these regions, the specialists located here also tend to be small. Small, highly specialized locations are also less likely to be invaded by the ever-encroaching generalists than are broader locations, and they tend to be more defensible if they are. When these resources are sufficient to sustain a specialist segment, the market can be said to be "partitioned" in that it appears that generalist and specialist organizations do not compete; they depend on different parts of the resource base.

The core insight of resource-partitioning theory comes from comparing the amount of space available for specialists when overall market concentration rises. Because market concentration derives from generalist consolidation, this comparison can be made by measuring the total area outside generalist targets under different stages of the generalist competition scenario. As explained, this area (total combined space of generalists) comprises more space when concentration is higher (fewer and larger generalists). Resource-partitioning theory holds that as this space increases, the viability of specialist organizations also increases. This prediction can be interpreted with respect to either founding rates or mortality rates (the specialist segment can expand as a result of changes in either).[4] In either case, however, the empirical implication is an interaction effect between organizational form (specialist-generalist status) and concentration on a vital rate.

HYPOTHESIS 1.— *Under conditions for resource partitioning, as market concentration rises, the founding rates of specialist organizations will rise* (a) *and the mortality rates of specialist organizations will fall,* (b) *where the* (*necessary but not sufficient*) *conditions for operation of resource partitioning processes include a finite and heterogeneous organizational resource environment, the existence of scale advantages for generalist or-*

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[4] Organizational growth rates are a more complex matter in this context because the specialist form often faces size constraints emanating from their identity, as we discuss at length below.

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ganizations, and limits on the target range and adaptability of both specialist and generalist formal organizations.

Resource distributions.—Of special interest is the shape of the resource space. By the usual imagery (Carroll 1985; Carroll and Hannan 1995), a well-behaved unimodal distribution is assumed, at least implicitly. This resource peak (and the scale advantages associated with it) is what drives organizations to the "center" of resource space, pushes them toward generalism, and would generate monopoly equilibrium (Boone, Carroll, and Witteloostuijn 1999). Péli and Nooteboom (1999) demonstrate mathematically, however, that even in a uniform distribution of resource space, the proportion of space available to specialists increases nonlinearly as the number of spatial dimensions increases. Their analysis holds constant the target areas of generalists and does not contain a mechanism for consolidation.[5] For industries based on consumer products, such as beer, the resource space can be reasonably interpreted as consumer demand (Péli and Nooteboom 1999). The dimensions of space can be interpreted as dimensions of taste preferences; that is, an increase in the dimensions represents an elaboration of tastes.[6]

Evidence.—Most empirical studies of resource partitioning have focused on the predictions of hypotheses 1a and 1b, which were originally the more novel aspects of the theory. Systematic empirical studies reporting an effect of this kind on organizational vital rates span a wide variety of organizational populations including newspapers (Carroll 1985; Dobrev 1997, 2000), early telephone companies (Barnett and Carroll 1987), breweries (Carroll and Swaminathan 1992, 1993), banks (Freeman and Lomi 1994), manufacturers of medical diagnostic imaging equipment (Mitchell 1995), wineries (Swaminathan 1995, 1998, 2000), automobile manufacturers (Torres 1995), microprocessor manufacturers (Wade 1996),

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[5] In our view, the Péli and Nooteboom (1999) analysis complements that of earlier theorists; it adds rigor to Carroll (1985) and Carroll and Hannan (1995), in addition to demonstrating the validity of basic resource predictions in multidimensional space.

[6] Péli and Nooteboom's (1999) analysis also can be used to generate a complementary set of empirical implications associating dimensional expansion in resource space with enhanced specialist viability: under conditions for resource partitioning, as the number of dimensions in resource space increases, the founding rates of specialist organizations will rise and the mortality rates of specialist organizations will decline, where the same conditions apply as in hypothesis 1. The difficulty with this argument, from our point of view, lies in disentangling cause from effect. Based on casual but sustained observation, we are convinced that in most "partitioned" industries there is indeed an increase in the dimensions of taste preferences (we discuss the case of beer below); we are less sure that tastes change exogenously, as Péli and Nooteboom (1999) imply to some analysts. Carroll and Hannan (1995) make a compatible (but much less elegant) argument about the possible flattening or broadening of the resource distribution over time. In their depiction, this development might be the consequence of an endogenous change in tastes, resulting from the prior success of specialist organizations.

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airline passenger service (Seidel 1997), investment banks (Park and Podolny 2000), law firms (Jaffee 2000), film production companies and film distributors (Mezias and Mezias 2000), and auditing firms (Boone, Broecheler, and Carroll 2000).

Generalist Consolidation

Empirical studies also occasionally look at the parallel "reverse" predictions about generalist vital rates (see, e.g., Carroll 1985; Carroll and Swaminathan 1992), but in studies without the complete (or even a long) population history these predictions are difficult to test statistically. This is because (as the theory predicts) at the late stages of many relevant industries, few generalists are present and few events occur.[7] But even when these tests can be conducted, there is a serious problem with the parallel specification for mortality: the theory does not claim that all generalists will experience heightened risk as concentration rises, only the smaller generalists (because of their scale disadvantages). In fact, *larger* generalists' life chances should actually be bolstered by the process. Thus, the parallel "reverse" specification to hypothesis 1b for generalist mortality mixes firms with contradictory theoretical predictions. So, we need a better way to model this aspect of the resource-partitioning process.

One new approach involves examining generalist behavior directly to look for consistency with various implications of the theory. For instance, Boone et al.'s (1999) study of the Dutch newspaper industry uses data on the demographic distribution of readers in the local audience to examine how the shape of the resource space affects consolidation. Likewise, Dobrev, Kim, and Hannan's (2001) study of the European automobile industries investigates firms' inertia and mortality with respect to each others' positions in the market and the implied resource distribution. As promising as these modeling efforts are, they require substantial additional data on firms and their environments—data that will often be unavailable or expensive and time-consuming to collect. Fortunately, significant progress can still be made by modeling generalist consolidation as a scale-based selection process in a way that requires only typically available information about the size distribution of generalist firms.

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[7] There is also a potential problem of definitional dependence between the concentration variable and generalist mortality. Usually, this problem can be avoided with careful attention to measurement and timing of observations among the independent and dependent variables.

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Scale-based selection.—The existence of scale advantages in production, distribution, and advertising in beer brewing has long been accepted, perhaps because cost data show them clearly (Backus 1999). Many scale arguments ostensibly posit absolute effects of size: in the conventional rendering, a firm's average cost per unit declines as a function of size. But, for industry evolution, the theoretical action in scale-economic arguments, and the use to which they are normally put, occurs because of the worsened consequences likely experienced by those (smaller) firms with relatively higher costs in competition with larger firms. (If the competing larger firms did not exist, then the outcomes of the smaller firms would be different.) In other words, scale differences generate selection pressures that eventually affect outcomes, including rates of mortality. The selection pressure varies depending on where a firm sits in the size distribution relative to its competitors.

How should scale-based selection pressure be modeled? Our approach here follows Barnett (1997; Barnett and Hansen 1996) in attempting to analyze the competitive intensity faced by a firm in its environment at any point in time.[8] Specifically, we seek to assess competitive intensity arising from relative differences in scale among a firm's competitors. We do so by examining the size structure of the competitive environment faced by each generalist firm at any point in time. In particular, we posit that the scale-based competitive selection pressure faced by a generalist firm depends on two factors: (1) the number of larger competitors it faces (each of whom hold a scale advantage over the smaller focal firm) as well as (2) the distance of each larger competitor from the focal firm on the scale dimension (with distance reflecting the extent of the advantage). These considerations can be combined into a single variable that repre-

[8] Our approach also follows most organizational ecology research in assuming that selection pressures may require significant time to produce expected outcomes. It agrees with Kay's (1995, p. 166) proclamation that "in assessing how they [economies of scale] influence the competitive position of different players, it is necessary to look at the very long run in which all costs can vary. During this long term, the type of plant and its scale of operation can be chosen freely, and the form of corporate organization also can be changed." This orientation differs from some others, which assume that selection is fast and highly efficient, generating expected outcomes almost instantaneously. This difference matters here because by our view the smaller firms engaged in scale competition will likely not be able to survive under unchanged conditions (because the scale pressures will eventually produce their results) while under the other view, they likely would survive under unchanged conditions (because they are held to be above the minimum efficient scale). As a colleague has remarked to us, the logic of the other view also can lead to a very different hypothesis than hypothesis 2—namely, that the greater a firm's distance from its smallest competitor on a size gradient, the lower its death rate (because this represents distance above the minimum efficient scale). We have explored this prediction in empirical analyses and do not find compelling or consistent findings, further reinforcing our convictions.

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sents the aggregate distance from larger competitors on a size gradient and yields the following prediction:

HYPOTHESIS 2.—*Under scale-based competition, the greater a firm's aggregate distance from larger competitors on a size gradient, the higher its organizational mortality rate.*

The distance measure in hypothesis 2 could be calculated according to any number of principles.[9] Because economies of scale drive much competition among beer brewers, we use in our analyses below a measure of distance based on the approximate shape of a typical long run average cost curve.

Product diversity.—Another area of research looks at the diversity of products offered by generalists as their numbers decline and concentration rises: the theory predicts a corresponding increase in generalist product homogeneity. Empirical studies of the U.S. music recording industry show that product diversity and innovation both declined with generalist dominance and consolidation from the mid-1950s to the early 1980s (Peterson and Berger 1975, 1996; Lopes 1992; Alexander 1996). For beer, Alison and Uhl (1964) and Jacoby, Olson, and Haddock (1971) conducted blind taste tests of beverages from generalist brewers (before the microbrewery movement). The findings showed that at this time of high concentration, consumers were incapable of discrimination and identification of these products, including their favorite brands. This scientific finding accords with commentators on the beer market at the time, who commented in consumer newsletters, such as one appearing in 1978, "If you taste one American beer, you've pretty much tasted them all" (Eckhardt 1999*a*, p. 22).

[9] Some colleagues have commented that this hypothesis apparently runs counter to that of ecological models of size-localized competition (Hannan and Ranger-Moore 1990), which predict a higher probability of death as a firm becomes closer to other firms on the size dimension. This would indeed be the case if the predictions were applied to the exact same group of firms. However, in the context of resource partitioning, the comment fails to recognize the importance of the condition on the hypothesis: it means that the argument applies only to (generalist) organizations engaged in scale competition while size-localized specifications usually apply to all organizations in a population. Because of this condition, the two models can be very consistent and might even agree under some conditions on predictions about an entire organizational population. For instance, in a "partitioning" population, the smallest generalists are those firms that face the strongest scale-based selection pressure, and they are also likely to be in the middle of the size distribution for the entire population and therefore should experience the greatest size-localized competition. That is, both models predict smaller generalists will have high failure rates in this context.

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BEYOND LOCATION—THE ROLE OF IDENTITY IN PARTITIONING

Resource-partitioning theory places primary emphasis on an organization's location in resource space, especially relative to other types of organizations. This logic forms the basis for hypothesis 1 and Péli and Nooteboom's (1999) findings, which together serve as the primary predictions for the specialist phenomenon. We also believe that it accounts almost entirely for the partitioning of certain industries, such as airline passenger service (Seidel 1997), where physical geography plays a central role. In some other industries, however, we believe that at some point cultural factors often take on greater importance than sheer location of products in resource space. Why? How? In this section, we address these questions by drawing on our qualitative analysis in the brewing industry to develop a theoretical argument. We do this by initially describing various brewers' interpretations, reactions, and organizational responses to the rise of specialty brewing.

The Rise of Specialty Breweries

Consider again U.S. beer brewing. As we demonstrate below statistically the rise and survival of specialist breweries corresponds to the presumed opening of peripheral product space created by consolidation among large generalist breweries (as expected by hypothesis 1). Industry participants also describe the development in those terms. One individual told us in an interview in 1988 that, "There is little difference left in the big brewers—it's all generic. . . . People are looking for something different and unique" (Cattani 1988). Another well-known microbrewer writes that "brewers took to brewing only one style. I call this type 'industrial beer' (it has been called worse). Industrial beer became a blight on the beer world and almost eliminated all varieties of competition. Worse, the industrial brewing establishment took to brewing even paler, ever more tasteless beers, such as high alcohol 'malt liquors,' 'dry beers' and now 'ice beers.' Today's craft brewing movement is a reaction against that mongrelization of beer" (Eckhardt 1995, p. 35). It is also obvious, and consistent with Péli and Nooteboom's (1999) analysis, that the emergence of specialist breweries coincided with a newly salient set of product preference dimensions based on a variety of taste characteristics (e.g., bitterness, "hoppiness," malt flavor), as well as color, foam, ingredients, freshness, alcohol level, and serving temperature.

The Responses of Mass Producers

After watching the size of the specialist market double annually while the overall beer market remained fairly flat, the major breweries decided

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to create and market their own specialty beers. Despite their vast resources and immeasurable technical expertise, these efforts have, for the most part, met with limited success. Some breweries encountered organizational problems that precluded adequate customer focus, needed reengineering of production facilities, and required development of intense employee incentives. For instance, a manager at Miller Brewing noted that "they [microbrewers] have a passion. . . . If we're to have any credibility and really add appropriate value, we have to understand where *they* are coming from and to understand the customer. . . . We're behind the curve, no question about it. We need to learn about specialty beer" (Kenny 1995, p. 13) A manager at market leader Anheuser Busch expressed similar thoughts, "We are trying to think differently. That's the whole thought process of the specialty beer business" (Kenny 1995, p. 13).

However, many of these problems were dampened (if not overcome entirely) by the creation of semiautonomous subunits or subsidiaries within the corporate structure. Coors was the first major brewery to do this with its Unibev Division, which was responsible for the successful Killian's Red product. As a manager at Coors sees it, "Management had the foresight to see that there was greater potential for the brand with greater focus and therefore created Unibev. It allows us the freedom and the autonomy to address these opportunities in the specialty segment" (Kenny 1995, p. 14). Unibev also handled Zima and the Blue Moon label.[10] At Miller Brewing, the American Specialty Craft Brewing unit was created for similar reasons as well as to generate "passion." This unit engaged in significant training and development: "We have people in here helping us train our palates and noses, working with our sensory development. We listen to guys tell how they built their microbrewing business, about investment, capital. We talk to entrepreneurs. We are immersing ourselves in this world" (Kenny 1995, p. 14). Anheuser Busch created its Specialty Brewing Group because "we [had] to think differently. . . . That was the purpose of separating out our group." The brewmaster of this group notes that "though it's been a challenge to develop the modifications needed to brew our specialty beer . . . we've gone from producing three beer brands in the early 1970s to more than 40 brands today" (Steele, 1997, p. 48). Likewise, Anheuser Busch's senior brand manager of the Specialty Brewing Group observes that "it's been a huge learning curve" (Hieronymus 1997, p. 24).

One measure of the major breweries' success in overcoming obstacles is the reception given some products—even within microbrewery circles.

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[10] Coors also owns Sandlot, a small semiautonomous brewpub located at Coors Field in Denver, a major league baseball park. Unibev has recently been the object of corporate reorganization.

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For instance, when Anheuser Busch's new hefeweizen (unfiltered wheat beer) product Crossroads was introduced, the microbrewery movement periodical *Pint Post* (1995, p. 7) wrote that "it featured the authentic fruity aroma of a traditional Bavarian-style hefeweizen. It is a unique beer and it is ironic that Anheuser Busch is producing a hefeweizen that is more true to the original style than the hefeweizen brewed by many craft brewers." Other Anheuser Busch beers such as the Muenchener Style Amber also received good reviews from Michael Jackson (1996), a popular gourmet beer journalist.

Although not every organizational obstacle to producing good specialty beer has been eliminated for every major brewery, there is consensus that most have (see Hieronymus 1997). It remains the case, nonetheless, that major breweries do not want to venture too far into small esoteric markets and usually prefer to focus instead on the "emerging" microbrew drinker whose tastes do not differ radically from those of their traditional customer bases. But when their products do overlap with specialists (as is increasingly the case), we would venture that on technical dimensions (such as quality, purity, freshness, and consistency), their performance would often meet or surpass many specialty brewery products. We also think that in blind taste tests within classes of products, most customers would find the majors' products indistinguishable from those of the microbrewers. In other words, the resource space of the microbrewers based on tangible product characteristics has not been inviolable.

Organizational Form Identity as a Constraint

What then is going on? Why does the specialty segment keep growing? Why are the major breweries unable to reclaim this part of the market? One matter that has proven especially problematic for the major breweries is their identity as large mass producers. Miller Brewing's president and chief operating officer notes that "research says 30 percent of [consumers] will not buy an Anheuser Busch product, and another 30 percent will not buy a Miller product. They think that all [products brewed by a particular brewery] taste the same, and [their] mind is closed" (quoted in Van Munching 1997, p. 247). Accordingly, two of three largest brewing firms conceal their identities on specialty products, attempting to enact the kind of robust identity described by Padgett and Ansell (1993) and Stark (1996). Among other deceptions, Miller Brewing created the fictional name Plank Road Brewery to put on its labels. Says a Miller executive, "We have proved that Miller, out of its main facility can brew great craft beer. But the consumer says that doesn't really compute. To consumers, Miller means high-quality mainstream beers at a premium price" (Kenny 1995, p. 14). Coors adopts a similar stance: "They [the specialty products]

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will not say Coors. We want them disassociated from the Coors family" (Kenny 1995, p. 14). Their Blue Moon line goes even one step further: it is actually brewed by another company via contractual arrangements. Only Anheuser Busch tried the opposite posture of revealing identity: "Our name is on our beers right now. We are who we are, and we're certainly not going to try to fool beer drinkers or hide behind another name. That's the worst thing you can do. We made a conscious decision about that because we think we brew very high quality beers. We should be proud of that and we are" (Kenny 1995, p. 14). But that statement does not square fully with some subsequent advertisements for its Pacific Ridge line of beers, where the company name plays an understated and subordinate role to the image of product and its creators (*San Francisco Weekly* 1997). Consider also the identity claims of a 1994 Anheuser Busch television commercial that stated: "We used to be a microbrewery too. Then we got better. And better. And better. And, yeah, a bit bigger as well."

Identity problems also plague companies with another organizational form in the industry, that of the so-called contract brewers who are often associated with the microbrewery movement because they sell specialty beers. Contract brewers, however, do not own brewing facilities and do not actually make their own beer—they contract for its production with other companies. Early contract brewers included such highly visible and successful entities as the Boston Beer Company (seller of the popular Sam Adams lager) and Pete's Brewing Company (seller of Pete's Wicked Ale among other products). By our count, 114 contract brewing firms were in operation in 1997 at one time or another. Contract brewers almost always conceal the true origins of their beer, which often comes from the plants of mass production breweries with excess capacity (Ono 1996). It is not unusual to see them referred to in the craft industry literature as "faux," "stealth," "virtual," and "pretend" breweries (see, e.g., Cottone 1995).

Authenticity and Organizational Form

In our view, the identity problems of both mass production and contract brewers emanate from their organizational form and revolve around questions of tradition and authenticity.[11] Consumers buying specialty beers

[11] The organizational form distinction is very operative in the industry: the Institute of Brewing Studies and the Association of Brewers (the major associations for craft brewers and home brewers) developed and rely on organizational classifications of brewing firms rather than products. For a rigorous analysis of the identity basis of organizational forms, see Pólos et al. (1998, 1999, 2000). For an insightful analysis of authenticity in a different commercial context, see Peterson (1997). For empirical dem-

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seek simply a malt beverage brewed in a small craftlike firm according to traditional methods and using natural ingredients.[12] This causes many of them to balk at beverages brewed by large corporations using modern methods of mass production and to reject outright those beverages sold deceptively by a business corporation.[13] It explains why both mass producers and contract brewers conceal their true organizational identities. It also explains why, in interactions (inspired by ethnomethodology) that we have engaged in, a crestfallen look comes on the perfectly content beer drinker when told that the specialty beer being consumed actually comes from a major brewing corporation or a company without a brewery at all.[14] Legitimacy as a producer of specialty beers requires operating a brewing facility. And, as August Busch IV notes, "There is a certain mystique to smallness" (Melcher 1995, p. 70).

Why? What drives consumers to purchase on the basis of organizational form identity rather than product characteristics? We offer four theoretical speculations. First, consumers might place great faith in the ability of small organizations to produce and deliver high-quality specialty products. This belief may or may not be factually sound; it might possibly come from an individual's negative experience with large bureaucratic organizations rather than positive experiences with small production organizations. Second, by choosing products made by traditional methods, consumers might be reacting against mass society, its production techniques and its corporate organizations (Peterson 1997). Such behavior would be consistent with Inglehardt's (1997) well-documented claims about "postmaterialism" and associated lifestyles, which purportedly emphasize self-expression and quality of life. Among other things, this reaction would explain the continued appeal of these products in light of obvious imperfections and quality defects. Third, consumers may be en-

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onstrations of the costs of violating normative codes about forms, see Zuckerman (1999) and Zuckerman and Kim (2000).

[12] There are also subtle aspects to distributing beer with this appeal, including never selling it in cans or green bottles, using traditional crowns rather than twist-off tops, getting it placed in the "right" venues, and not using traditional marketing methods.

[13] About mass produced beers, e.g., Papazian (1998, p. 9) says: "I would hesitate—dare I say—to call some of that mass produced stuff 'beer.' Given the choice, I'd rather pay to drink wine or water." About deception, Van Munching (1997, p. 258) quotes August Busch IV: "50 percent of the consumers go haywire when they find out [that Plank Road] is not a real brewery."

[14] Consider, e.g., the following typical query from a microbrewery newspaper: "When I go to the supermarket now, I am faced with a choice: Do I purchase a megabrewed ale, which may be (for all I know) a tasty, high quality, true-to-style beer, or do I instead give my money (sometimes paying more) to the craft brewers who have built this market from scratch, who have worked hard to earn my dollar and my respect, and who have contributed enormously to the beer environment in this country?" (Jones 1997, p. 6). "Megabrewed ale" refers to an ale made by a major brewery.

acting a form of self-expression in purchasing the products of small, obscure producers. This too might be seen as a reaction against mass society, but we would be hesitate to call it a general postmaterialistic one, if for no other reason than the preponderance of affluent young professional consumers who otherwise embrace materialistic values and mass-produced objects, such as German sports cars. The anti–mass production sentiment for these individuals seems to be confined to certain isolated parts of their lives, usually related to private personal consumption. Fourth, consumers may be using specialty brewing as a forum for status generation. Like many specialty products, malt beverages are inherently difficult to categorize and evaluate because of their subtle and ambiguous complexities. Expert knowledge is required; however, expert status is subjective and relative—one appears knowledgeable simply by virtue of knowing more about particular types of products and their characteristics then others. Public displays of this knowledge commonly yield social approval and confer status. With products associated with personal taste and lifestyle, the status conferred is more general than that of expert: it invokes an overall image of sophistication and refinement. Consumers may seek obscure specialty products particularly because they are believed to possess unusual but attractive qualities; however, the fact that they potentially generate status for knowledgeable consumers may constitute a large part of their appeal.

Strategy and Form Identity

Because of their salience in this market, microbrewery and brewpub operators strategically deploy their form identities. As with social movements, identity is used both to educate and to challenge mainstream consumers' perceptions of beer as a product and to criticize the values and practices of the dominant generalist firms and deviant specialist firms (see Bernstein 1997). Participants in the microbrewery "movement" attempt variously to portray their firms as small production organizations that refuse to cut corners in their quest for quality, care about their customers and communities, employ traditional methods and ingredients, and appeal to the most discerning of consumers. For instance, the president of the Association of Brewers claims: "Craft specialty brewers clearly represent a different attitude. . . . Opportunity and the true culture of beer currently lies in the hands of small brewers and those who promote craft, tradition and—dare I say it—beer" (Papazian 1998, p. 9)

Small specialty brewers try various tactics to differentiate and distance themselves from other types of brewing firms, which are presumed to pursue baser goals (see, e.g., Simpson 1996; Shipman 1997; Papazian 1998). For instance, the undisputed pioneer of the microbrewery move-

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ment, Fritz Maytag of Anchor Brewing in San Francisco, told us quite proudly in the late 1980s that "most people won't like our beer." He also claims that "the reason that the whole microbrewing renaissance has succeeded is that the early pioneers were interested in making beer. People were in love with the idea of brewing beer. That's been a fantastic source of energy and has fueled public approval of our movement" (Maytag 1996, p. 22). Compare that attribution to what Maytag says about some contract brewers: "These are the people whose goals are to make money—not to make beer. You [we, the industry] get invaded by a lot of people who don't care, as long as they make money" (Maytag 1996, p. 22). Many others, who regularly use such terms as "revolution" and "renaissance" to describe craft brewing activities and "enemy" to describe the mass producers, echo Maytag's sentiment.[15]

Using identity-based strategies, microbreweries and brewpubs have attempted to define cognitively the specialty beer segment in ways that exclude major brewers and contract brewers.[16] In our view, these oppositional identity strategies work in this context because the microbrewery movement actually resembles a true social movement in many respects (Carroll 1997; Swaminathan and Wade 2001). Among other things, the social movement–like character of the segment means that craft producers and consumers constitute a self-conscious community characterized by a dense and redundant social network of self-styled "experts," including many homebrewers (see Bradford 2000). Information flows rapidly and pervasively through this network, which revolves around the many brewpubs, tap houses, beer clubs (many with selective incentives), organized trips, brewers' guilds, festivals, magazines, and newsletters found in the

[15] Deb Carey, e.g., of New Glarus Brewing Company says, "When someone tells me they don't brew their beer anymore, that tells me they've lost their passion for beer. That means to me that they're in a whole different world. They're consumed with money. That's very sad" (Shellenberger 1996, p. 27).

[16] There is a great deal of irony here when the larger microbreweries and brewpub chains begin to feel the negative effects of some of the movement's own rhetoric about corporations making beer. Perhaps for this reason, George Hancock, the CEO of Pyramid Breweries (one of the larger and more corporatized micros) complained that the classification system based on a firm's annual production level was "nonsense" and that "the industry would be better served by a definition of craft beers—focused on ingredients and brewing process—rather than craft brewers" (*New Brewer* 1997). This alternative classification scheme would, of course, allow mass producers to offer craft beers sanctioned as legitimate by the microbrewery movement, a development likely to be resisted strenuously.

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"microbrewery" segment.[17] Misinformation—such as deceptive or inauthentic identity—eventually gets discovered and ferreted out through ridicule, boycott, and other normatively imposed sanctions. Sometimes this takes the form of deliberate public exclusion, such as with the Oregon Brewers Guild, which developed a quality mark program "to identify beer brewed by authentic craft brewers in Oregon and to further the awareness of Oregon craft beers." As one expert observer notes: "It is clear that this program is aimed at contract brewing and, to a lesser degree, at large brewers faking craft brewing" (Eckhardt 1999*b,* p. 20).

Consequently, the robust identity strategies attempted by the major breweries and the illusory authenticity of the contract brewers are effective only for short periods, if at all. We believe that the ineffectiveness of these strategies explains why many major brewers and some contract brewers have now adopted approaches that minimize (if not avoid) these problems. For major breweries, the most viable route apparently involves strategic alliances with microbreweries based on large initial equity investments.[18] For example, Anheuser Busch recently took a large ownership position in Redhook, a pioneer microbrewing firm from Seattle; Anheuser Busch also recently formed a strategic alliance (involving equity and distribution) with Widmer Brothers Brewing Company of Portland, a firm known for its highly distinctive American hefeweizen beer. Miller Brewing bought controlling equity in Celis, a very highly regarded brewer of Belgian-style ales in Austin, Texas. And, United Brewers of America, a company controlled by Vijay Mallya, the owner of several large foreign mass-production beer companies, bought a controlling equity stake in pioneering Mendocino Brewing Company (founded in 1983) and then subsequently acquired Ten Springs Brewing Company in New York state. The alliances involve arrangements for additional capital infusion, ex-

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[17] It is difficult to estimate the numbers of some of these activities and groups, especially the more local and less formal ones. Among the more established activities and groups, the Institute for Brewing Studies (1998) lists 33 state brewers guilds (with three more in formation), 37 beer journals, 13 regional beer journals, and 6 beer internet publications. Beer festivals of all kinds are routinely advertised; there are scores of them every year, the largest of which draw tens of thousands of persons. Beer clubs are ubiquitous. A few microbreweries have also publicly offered equity in the company and encouraged their customers to buy small amounts of shares as a way to stay connected and involved.

[18] The solution is perhaps the best available, but it is still not perfect. Microbrewers who enter into these alliances are frequently criticized for "selling out" and their products lose some appeal to hard-core microbrew drinkers. For instance, a recent headline in craft beer magazine asked, "Who Owns Redhook?" (*All about Beer* 1999). With time and integration into the larger company, there will also likely be some real change in these companies' products and their approaches to the market.

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pansion of production facilities and privileged access to massive distribution networks. Industry insiders expect more such alliances.

For contract brewers, the solution to problems of identity is to buy and operate a brewery, as Boston Beer Company recently did (with the purchase of the Cincinnati-based Hudepohl-Schoenling brewery) after trying various other approaches.[19] Pete's Brewing Company did not attempt this solution in time and, after suffering significant losses in market share, was acquired and absorbed in 1998 by Gambrinus Company, which is known primarily as the distributor of the Mexican import Corona.

Empirical Implications

What, if any, empirical implications do these identity issues have for resource partitioning? Our view is that they do not necessarily undermine the basic predictions of the theory (although they may weaken some effects as location recedes in importance); rather they imply additional arguments. Identity problems of the kind faced by mass-production and contract brewers emanate from questions of legitimation: aspects of these organizational forms conflict with specialty brewers' claims about tradition and authenticity, which accord with consumers' and others' normative notions about how specialty beers should be made and marketed in the United States (especially when compared to microbrewers and brewpubs). By organizational ecology's model of density-dependent long-term evolution, we might expect that, as the density of such specialist organizational forms rises, so too would their legitimation (see Carroll and Hannan 2000). But this model implies that norms are endogenous—that they change with rises in density. This is very likely the case for organizational forms defining entirely new industries where few, if any, preconceptions about organizations and products already exist. For renewals in established industries, density effects of specialists may differ by organizational form because norms are maintained and sanctioned by an existing knowledgeable tight-knit community of consumers and producers, thus making it very difficult for an organizational form such as contract brewing to be legitimated.

As the qualitative story above tells, much of the appeal of specialty beer lies in public claims about tradition and authentic craft-style pro-

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[19] Jim Koch, e.g., the CEO of Boston Beer Company who is widely considered a brilliant marketer, tried many pitches to overcome this identity problem, the most famous of which compared beer brewing with gourmet cooking and asked whether the quality of Julia Child's cooking came from the cook or the kitchen (see Van Munching 1997). Koch also operated a small showcase brewery for a while to counter claims that he did not own a brewery, but most of the company's beer was still made by other breweries on contract.

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duction. The normative problems confronted by contract brewers occur because, upon inspection, this organizational form cannot live up to these claims—there are inconsistencies that eventually become obvious. We would thus not only expect this kind of form not to be legitimated as it proliferates, we would also expect that its spread would exacerbate identity problems because greater numbers of consumers and others will come into closer contact with organizations using it and will therefore learn about the inconsistencies. At the same time, we would expect that those forms possessing characteristics that apparently satisfy identity claims to experience the density-driven legitimation process. Moreover, we would expect that those forms whose claims are more readily inspected (i.e., greater social visibility) to display a stronger legitimation process (i.e., greater returns to density). Given the oppositional nature of the form identities, we would also expect the densities of the various forms to interact in predictable ways: an "identity-consistent" form should aid the legitimation process of associated forms while an inconsistent form should diminish legitimation when it can be visibly distinguished. A general version of these arguments can be stated as:

HYPOTHESIS 3.—*Under resource partitioning based on identity, the legitimating effects of specialist organizational form density depend on the form's normative valuation relative to identity claims* (a) *and its social visibility* (b).

Application to American Brewing

Of course, applying this highly abstract hypothesis to any specific industry requires determination of the normative status of its organizational forms, which in turn requires an institutional understanding of the context. In the case of beer brewing, our discussion above makes clear that the microbrewery and brewpub specialist forms apparently match identity claims about authenticity, while the contract brewer form does not. The brewpub is also the most socially visible organizational form because of its storefront location, its accessibility to the public, and the (usual) direct observability of its production equipment (proudly on display behind glass). Perhaps for this reason it is claimed that "brewpubs helped make the [craft brewing] industry a grassroots movement" (Hieronymus and Labinsky 1998, p. 15).

Although it is not easy to consume a brewpub's beer without some awareness of its origins, the same is not true for microbreweries: without additional information the products of microbreweries and contract breweries are often indistinguishable. Additional information likely comes more quickly in some areas (dense urban areas) and social circles (young pro-

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fessionals) than others, but it undoubtedly comes as the numbers of organizations using the various forms (density) increase.

These observations lead us to expect that both microbreweries and brewpubs will be legitimating in the sense that initial rises in density will elevate founding rates and lower death rates.[20] Because of its social visibility, the effects of brewpub density should be stronger. Contract brewers' density may show the opposite effects. Moreover, we expect that form-specific densities will interact in ways that heighten their differences when visible (brewpub and contract brewer) and minimize them when not (microbrewery and contract brewer).

DATA AND METHODS

We used a variety of sources to compile organizational life-history data on the complete population of brewing firms operating in the contemporary period; that is, from 1938 (five years after the tumultuous period following the repeal of prohibition) to the end of 1997 (the most recent date for which we could obtain and compile reliable data). These data allow us to conduct systematic tests of the hypotheses.

Data Sources on Brewing Firms

Our primary source of event-history data for the early population of brewing firms was the volume *American Breweries* by Bull, Friedrich, and Gottschalk (1984). The data were verified and refined using annual lists of brewing firms published in the *Modern Brewery Age Bluebooks* (Modern Brewery Age, various years) and the *Brewers Almanac* (U.S. Brewers Association, various years), which uses the Department of Alcohol, Tobacco, and Firearms as its primary source. The historical coverage was extended to the end of 1997 with information gathered from Tremblay and Tremblay (1988) and the *Microbrewery Resource Handbooks* (Institute for [Fermentation and] Brewing Studies, various years). We also used the Internet to identify and collect information. On occasion, we examined the web pages of individual companies, but we also relied on those web pages covering the entire industry (in particular, we found

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[20] Applying the hypotheses in this way, to all firms operating with a particular form, overlooks any organization-specific variations in normative status within the form. We believe that these variations are potentially important and should be kept in mind in interpreting findings—consumers and the rest of normative community differ in both their information and assessments about particular microbrewers, brewpubs, and contract brewers. We currently have no systematic data to use that measures these variations.

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helpful the three sites titled "Beer Is My Life," "The Real Beer Page," and "Eric's Beer Page").[21]

Variables Used in the Analysis

The firm-level data we were able to compile from the above sources and use in the analysis include time-varying (annual) information on the following variables: organizational form (mass producer, microbrewery, brewpub, or contract brewer); size (production capacity);[22] number of sites (brewpubs only); and a dummy variable indicating the brewery was operating at the beginning of the observation period (1938).

From the individual firms' life-history data, we computed aggregate counts of density, foundings, and deaths in any given year. These were also calculated by organizational form (total, combined specialist total, mass producer, microbrewery, brewpub, or contract brewer) and occasionally by geographic proximity (inside and outside state of operation) for the locally oriented brewpubs and microbreweries. To maintain consistency with our conceptualization of forms as socially coded identities and to avoid double-counting densities, we established a hierarchical counting rule for hybrid organizations. We counted each hybrid firm only once depending on its highest order form as determined by the ordering

$$massproduction \Rightarrow micro \Rightarrow pub \Rightarrow contractbrewer.$$

By this rule, for instance, a mass producer is counted only as a mass producer no matter what else it might be doing. These variables play instrumental roles in testing and evaluation of hypothesis 3.

Four-firm concentration ratios, which are pivotal in examining hypothesis 1, were calculated as the combined market share of the four largest firms. These estimates are based on sales data reported in the

[21] We viewed these sites in 1999. Richard Stueven's Internet web page, "Beer Is My Life," was found at the time of this writing at http://www.beerismylife.com; The Real Beer Page, at http://www.realbeer.com; "Eric's Beer Page," by Eric Wooten, at http://www.ericsbeerpage.com.

[22] Size is measured as production capacity, and, in the preponderance of the 16,346 total spells, it is available. In 7.9% of spells, a firm's capacity is not given for a particular year but can be confidently interpolated from earlier and later years. In another 0.8%, we relied on a firm's prior maximum production output to infer capacity. Finally, in another 3.3% of spells, we estimated a capacity value for a firm, assuming its lack of information in standard sources implied a small size (confirmed by our industry knowledge). For these firms, we assigned capacity by taking the value of the first size quartile for its organizational form for that year and multiplying it by a random uniform deviate. Preliminary analyses showed that model estimates and conclusions are not sensitive to these procedures.

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Modern Brewery Age Bluebooks and the *Microbrewery Resource Handbooks*.

To test hypothesis 2, we constructed a measure of the aggregate distance of larger firms from the focal firm. Our purpose was to aggregate approximate distances along a gradient resembling the long-run average cost curve typically posited for economies of scale, which is downward sloping with scale at a decreasing rate. After experimenting with various functions that might produce this downward sloping curve, we chose to use the inverse quadratic root of the size variable *S,* after adjusting for minimum size.[23] The exact calculation is given by $[(S_{it} - S_{\min})^{-1/4}]$. To construct the distance variable, we first calculated each firm's position at each point in time using this formula. After locating all firms' positions on the curve, we then computed the aggregate distance of each firm *i* from its larger competitors at any given point in time by summing the differences in scores as

$$D_{it} = \sum_{S_{jt}>S_{it}} (S_{it} - S_{\min})^{-1/4} - (S_{jt} - S_{\min})^{-1/4}.$$

We also coded data on industrial conditions. Aggregating individual firm production figures, which are available in the *Modern Brewery Age Bluebook* and the *Microbrewery Resource Handbook,* allowed us to derive the total annual production of microbreweries and brewpubs. To capture increasing consumer affluence, we coded real per capita disposable income in 1987 dollars in each state from the *Economic Report of the President* (U.S. Government Printing Office 1999) and *Regional Accounts Data: State Personal Income,* compiled by the Bureau of Economic Analysis (U.S. Department of Commerce, various years). We coded gross national product as well. Finally, we used a time-trend variable to measure post-Prohibition industry age.

Stochastic Models

We use standard modeling frameworks for estimating models of organizational founding and failure rates. This means that we regard firm foundings and deaths as rare events governed by stochastic processes. The transition rate of event occurrence is defined as

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[23] We use this specification because of the consistency of its shape with the stylized long-run average cost curve found in discussion of scale economies in textbooks. We have experimented with other consistent functions, including especially those of lower-order roots, and we find results to be generally robust. We adjusted for minimum size so that the high returns to scale occur within the observed range of the size variable. A plot of the function is provided in appendix fig. A1.

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$$r(t) = \lim_{t' \to t} \frac{\text{prob}(t \le T < t' \mid T \ge t)}{t' - t}.$$

We estimate models that specify the rate as a function of time t and a vector of covariates, A, measuring organizational and environmental characteristics:

$$r(t) = f(t, A).$$

Founding rates.—For founding, we follow convention and regard the organization population as the unit at risk for experiencing events. We specify that foundings follow a counting process and treat each entry as an event or transition (see Hannan and Carroll [1992] for a full explanation). Because the source data for foundings are precise only to the year (and there are multiple events in some years), we cannot determine waiting times between all events. So for estimation, we use aggregated event-count data that record the number of events in a given year. It is common to analyze data of this form with Poisson regression models or with negative binomial regression models if the data are overdispersed (meaning that the variance in the counts is greater than the mean, an assumption of the Poisson). Here the overdispersion in the data arises from the years with zero foundings, so we used an econometric model designed for this situation, the so-called zero-inflated Poisson (see Greene 2000). The model for Y_i, the number of foundings in a given year, is given by two equations: $Y_i = 0$, with probability q_i, and $Y_i \sim \text{Poisson}(\lambda_i)$, with probability $1-q_i$. This implies that $\text{prob}(Y_i = 0) = q_i + [(1-q_i)R_i(0)]$, and $\text{prob}(Y_i = j > 0) = (1-q_i)R_i(j)$, where $R_i(y) = \exp(-\lambda_i)\lambda_i^{y_i}/y_i!$, the Poisson probability, and the rate of events $\lambda_i = \exp(\beta'X_i)$. The state probability q_i is specified as $q_i \sim \text{logistic}(v_i)$, where $v_i = \gamma'Z_i$.

In the zero-inflated Poisson model, X_i is a vector of variables that influences the occurrence of non-zero counts, years with one or more founding events, and Z_i is a vector of variables that influences zero counts, years with no founding events. In our analysis, we expect the likelihood of zero founding events declines with post-Prohibition industry age, and therefore we include this variable in the part of the model that predicts the occurrence of zero events. Exploratory analysis showed that the event counts are not overdispersed in the zero-inflated Poisson framework. We estimated the effects of covariates using the LIMDEP package (Greene 1998).

Mortality rates.—For mortality, we consider the organization as the unit at risk and estimate models of firm-specific death rates. Because organizational death rates typically show age dependence but the form of that dependence varies widely (Hannan et al. 1998*a*, 1998*b*), we use a

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piecewise constant rate model that allows the rate to vary nonmonotonically with age. This model is

$$r(t) = \exp\{\alpha_l + A\alpha\} \qquad \text{if } t \in I_l,$$

where α_l is a constant associated with the lth time period, A is a vector of covariates measuring organizational and environmental characteristics, and α is a vector of estimated coefficients assumed not to vary across periods. Exploratory analysis revealed that a good-fitting parsimonious specification of this model uses time periods with ages (in years) of 0–1.0, 1.0–3.0, 3.0–10.0, 10.0–15.0, and more than 15. We estimate the effects of covariates in models with this period specification with maximum-likelihood procedures using the TDA package (Blossfeld and Rohwer 1995). In all except a few highlighted models reported here, we constrain the effects of covariates to be constant across periods; that is, the effects of covariates are proportional with respect to age. This specification is the simplest and conforms to standard practice in organizational ecology. Covariates are measured annually and treated as time varying in the analysis by artificially censoring organizational lifetimes each year and updating values.

FINDINGS

Foundings Analysis

We report the empirical analysis in three steps.[24] We first present estimates of models of specialist organizational foundings, pertinent to hypothesis 1a. Because there are hardly any mass producer foundings in the observation period, this analysis by necessity focuses on specialist organizational foundings. The second step of our analysis examines the mortality of mass producer breweries. The estimates of these models speak to hypothesis 2. The third step investigates mortality models of the specialist breweries. We report separate estimates of the three specialist organizational forms: microbreweries, brewpubs, and contract brewers. The findings here pertain to hypotheses 1b and hypothesis 3.

Table 1 presents the estimates of the zero-inflated Poisson models of specialist organizational foundings. The various estimated equations specify as dependent variables different aggregations of the specialist populations—total combined (all three specialist forms) and by particular organizational forms. In the first two equations, the core prediction of resource-partitioning theory relating market concentration to specialist

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[24] Descriptive statistics for the various data sets used in the analysis can be found in the appendix.

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TABLE 1

ESTIMATES OF ZERO-INFLATED POISSON MODELS OF FOUNDING RATES, 1938–97

	ALL SPECIALISTS	BREWERIES		
		Micro	Pub	Contract
Constant	-8.66^*	-3.91^*	-18.55^*	-20.39
	(1.27)	(1.76)	(3.68)	(11.05)
C4 market share[a]	$.065^*$	$.081^*$	$.053$	$.131$
	(.018)	(.030)	(.033)	(.093)
Specialist density/10	$.052^*$			
	(.004)			
(Specialist density)^2/10,000	$-.035^*$			
	(.004)			
Microbrewery density/10		$.189^*$		
		(.022)		
(Microbrewery density)^2/10,000		-1.233^*		
		(.356)		
Brewpub density/10			$.074^*$	
			(.013)	
(Brewpub density)^2/10,000			$-.434^*$	
			(.162)	
Contract brewery density/10				$-.004$
				(.266)
(Contract brewery density)^2/10,000				-2.983
				(2.505)
(Contract density × micro density) /10,000		$-.037$		7.922^*
		(.535)		(2.284)
(Contract density × brewpub density) /10,000			$-.165$	-5.152^*
			(.457)	(1.591)
(Micro density × brewpub density) /10,000		$.653^*$	$.500^*$	
		(.247)	(.187)	
Real per capita disposable income[b] ...	$.455^*$	$-.091$	1.215^*	$.825$
	(.131)	(.215)	(.304)	(.795)
Post-Prohibition industry age[c]	$-.117$	$-.918$	$-.139$	$-.189$
	(.861)	(.484)	(7.48)	(178.4)
N founding events across years	1,551	515	869	167
Restricted log L	$-2,851.687$	-940.900	$-1,719.011$	-320.912
Poisson log L	-107.457	-75.491	-71.390	-48.623
Zero-inflated Poisson log L	-107.434	-75.280	-71.388	-48.623
Vuong statistic	.508	2.059	.394	.272

NOTE.—Nos. in parentheses are SEs.

[a] As % of total industry sales.

[b] Figures are in constant 1987 $U.S.

[c] Post-Prohibition industry age is calculated by (calendar year − 1933).

* $P \leq .05$.

proliferation (hypothesis 1a) is strongly supported. Effects of the four-firm measure of market concentration are positive, large, and statistically significant, showing that both total specialist foundings (all three forms) and microbrewery foundings increased with concentration. In the equations for brewpub foundings and contract brewer foundings, the concentration variable is also positive, as expected, but it is not significant.

The other hypothesis relevant to table 1, the argument (hypothesis 3) about the identity-based effects of density, also receives positive support. For both microbreweries and brewpubs, the form's own density shows the expected curvilinear relation between density and foundings. This pattern suggests that each of these forms underwent a legitimation process—initial increases in a form's own density significantly increased the form's founding rate. By contrast, the contract brewer form shows no significant effects of own density and the estimated coefficients are all negative, suggesting that as contract brewers became more prevalent, their legitimation status worsened if anything. This pattern agrees with expectations given the normative problems of contract brewers with respect to identity claims about authenticity.

Table 1 also reports the effects of interactions of form-specific densities relative to hypothesis 3. In both the microbrewery and brewpub equations, the interaction of densities for these two forms display strong, significant positive effects, indicating that the two forms work together to strengthen legitimation processes. This makes sense in terms of the theoretical argument because the brewpub form is socially visible and both forms pass normative valuation tests for authenticity. In the contract brewer equation, a different pattern emerges. Here the contract brewer density variable interacts significantly with microbrewery density to increase foundings while it interacts significantly with brewpub density to dampen foundings. Again, this pattern supports hypothesis 3: increased prevalence of the indistinguishable but authentic microbrewery form potentially aids legitimation of the contract brewer form while the distinguishable and socially visible brewpub form speeds up the process leading to its negative normative valuation.

Mortality Analysis

Mass producers.—Table 2 presents estimates of models of mortality rates for mass production breweries, pursuant to testing the scale competition argument of hypothesis 2. Models 1 and 2 show the simplest specifications. Estimated effects of contemporaneous density (total density, calculated across all organizational forms) are consistent with received theory and previous research—the linear density term shows a negative coefficient and the second-order term is positive, yielding a nonmonotonic

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TABLE 2
ESTIMATES OF PIECEWISE CONSTANT RATE MODELS OF MASS PRODUCTION BREWERY MORTALITY

	MODEL							
	1	SE	2	SE	3	SE	4	SE
Age:								
$0 < u \leq 1$	−1.048	(.563)	−1.078	(.563)	−.440	(.685)	.083	(.833)
$1 < u \leq 3$	−.196	(.455)	−.289	(.456)	.351	(.600)	.874	(.763)
$3 < u \leq 10$	−.846	(.451)	−.875	(.451)	−.239	(.599)	.281	(.762)
$10 < u \leq 15$	−1.714*	(.506)	−1.757*	(.507)	−1.171	(.653)	−.639	(.807)
$u > 15$	−1.171*	(.466)	−1.223*	(.466)	−.694	(.597)	−.192	(.745)
Density/100	−.381*	(.117)	−.382*	(.118)				
Density²/100,000	.322*	(.122)	.317*	(.123)				
Density (t_0)	−.009	(.011)	−.009	(.011)				
(Mass producer density)/100					−.505*	(.159)	−.592*	(.187)
(Mass producer density)²/100,000					.363*	(.163)	.409*	(.176)
Mass producer density (t_0)/100					−.007	(.011)	−.007	(.011)
Microbrewery density							.025	(.021)
Brewpub density							−.015	(.013)
Contract brewer density							−.004	(.033)
Size/100,000	−.021*	(.005)	−.020*	(.005)	−.020*	(.005)	−.020*	(.005)
$D_{it}/10$ (ASDLO)			.021*	(.005)	.021*	(.005)	.021*	(.005)
Tax paid withdrawals[a]	.010	(.047)	.011	(.047)	.026	(.047)	.021	(.051)
Real GDP[b]	−.017	(.016)	−.017	(.016)	−.041*	(.019)	−.056*	(.026)
Operating in 1938	−.393*	(.185)	−.366*	(.186)	−.295	(.199)	−.290	(.201)
Log L	−2,460.3		−2,454.0		−2,454.2		−2,453.3	

NOTE.—N of spells = 10,648; N of events = 680. ASDLO stands for aggregate size difference of larger organizations.

[a] Tax paid withdrawls are given in 10 million gallons

[b] Figures are in 100 billion constant 1987 $U.S.

* $P \leq .05$.

U-shaped relationship of density with mortality. Density at founding is negative and not significant. Organizational size shows a large and statistically strong negative effect.

The variable of greatest interest here for hypothesis 2, D_{it} (the aggregate distance of a firm from its larger competitors), adds considerably to the explanatory power, as shown by the change in the log likelihood from model 1 to model 2. This variable displays a strong and significant positive effect on mortality. This effect is consistent with the prediction of hypothesis 2 and suggests strongly that scale competition among generalist brewers depends on a firm's size relative to its larger (stronger) competitors.[25]

The final two models in table 2 show what happens when form-specific versions of the density variables are used in specifying the equation. Model 3 substitutes mass producer density variables for total density. Again, the contemporaneous density variables perform as expected, showing a curvilinear effect. Moreover, the absolute values of the density coefficients are greater than in the previous models. Model 4 adds to the specification the specialist density variables by form; these effects are never significant, a pattern consistent with the resource-partitioning logic that envisions generalists affecting space for specialists but not vice versa. In both models 3 and 4, the scale competition variable continues to show strong, significant, and positive effects. All in all, the findings for mass producer mortality strongly support hypothesis 2 and suggest the operation of scale competition.

Microbreweries.—In table 3, we show estimates of models of mortality rates of microbreweries. As predicted by hypothesis 1b, the effects of market concentration are negative and significant, showing that microbrewery mortality drops when the market concentrates. These effects are robust across all four models and provide strong support for basic resource-partitioning theory.

The form-specific density effects predicted by hypothesis 3 also receive support here. Microbrewery density shows a strong and significant negative effect, suggesting that legitimation of the form occurs as it spreads.

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[25] Following the suggestion of an *AJS* reviewer, we reestimated the models in table 2 using market concentration (C4 market share) as a control variable. We do not favor this alternative specification because we are concerned that the concentration variable is potentially confounded with the outcome (large mass producers comprise the C4 measure). Nonetheless, the change in specification matters little for the hypothesis: the scale competition variable continues to show a strong significant positive effect, although concentration also shows a positive and significant effect on mass producer mortality. Following Hannan et al. (1998*a;* 1998*b*), we also estimated models of mass producer mortality with age-specific effects of size. Using this specification of size does not appreciably change the effects of the scale competition variable based on aggregate distance, so we do not show here the estimates of these more complex models.

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TABLE 3
ESTIMATES OF PIECEWISE CONSTANT RATE MODELS OF MICROBREWERY MORTALITY

	MODEL			
	1	2	3	4
Age:				
$0 < u \leq 1$	25.10*	26.31*	22.36*	22.36*
	(7.08)	(6.96)	(7.16)	(7.15)
$1 < u \leq 3$	25.82*	27.03*	22.64*	22.67*
	(7.08)	(6.95)	(7.16)	(7.16)
$3 < u \leq 10$	25.69*	26.93*	22.15*	22.15*
	(7.07)	(6.94)	(7.14)	(7.14)
$u > 10$	24.81*	26.08*	21.24*	21.22*
	(7.11)	(6.97)	(7.17)	(7.16)
ln(capacity)	−.260*	−.260*	−.291*	−.296*
	(.065)	(.065)	(.067)	(.066)
C4 market share[a]	−.254*	−.269*	−.192*	−.191*
	(.064)	(.062)	(.065)	(.065)
State microbrewery density	−.005*	−.005*	−.029*	−.029*
	(.002)	(.002)	(.007)	(.007)
(State microbrewery density)^2				
/1,000	−.015			
	(.304)			
State microbrewery density (t_0)	.043*	.039*	.051*	.040*
	(.017)	(.014)	(.016)	(.014)
Out-of-state microbrewery				
density	.004			
	(.005)			
National mass producer				
density	−.201*	−.207*	−.227*	−.227*
	(.071)	(.070)	(.074)	(.074)
State brewpub density	−.014	−.015*	−.011	−.016*
	(.009)	(.007)	(.008)	(.007)
National contract brewer				
density	.008	.023*	.010	.011*
	(.018)	(.005)	(.006)	(.005)
(State microbrewery density				
× state brewpub density)/100			−.004	
			(.003)	
(State microbrewery density ×				
national contract brewer den-				
sity)/100			.021*	.020*
			(.006)	(.005)
Log L	−395.8	−396.2	−387.3	−388.1

NOTE.—N of events = 109; N of spells = 2,194. Nos. in parentheses are SEs.

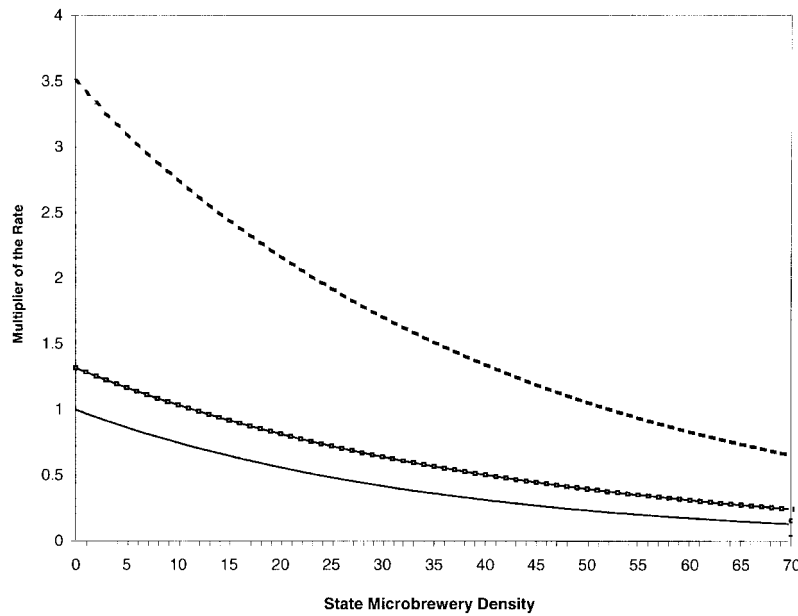[a] As a % of total industry sales.

* $P \leq .05$.

Fig. 2.—Effect of contract breweries on the microbrewery mortality rate. Solid line represents national contract brewery density = 0; connected dots, national contract brewery density = 25; broken line, national contract brewery density = 114.

The socially visible brewpub form apparently contributes to this process: its density variable is negative in all models and significant in two, including the best-fitting model, 4. There is no significant interaction effect between microbrewery density and brewpub density, which is consistent with their visible distinguishability. By contrast, the contract brewer form apparently hampers the legitimation of microbreweries: its density variable shows a positive effect on mortality and is significant in the best model. In addition, the interaction between the densities of the difficult-to-distinguish forms of microbreweries and contract brewers is positive and significant (model 4), as predicted by hypothesis 3.

Figure 2 shows the effect of contract brewer density on the rate of microbrewery mortality, based on the estimates of model 4 in table 3. The curved line at the bottom of figure 2 shows the effect of increases in state microbrewery density on the microbrewery mortality rate. The microbrewery mortality rate declines by 81% (the multiplier decreases from 1.0 to 0.19) as state microbrewery density increases from zero to its observed maximum of 70. This effect is obtained in the absence of contract breweries. The top two lines of figure 2 illustrate the effect of contract breweries on the microbrewery mortality rate. The middle line with a marker plots

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the multiplier of the rate when national contract brewery density is at its mean value of 25. The effect of an increase in contract brewery density from 0 to 25 is to elevate microbrewery mortality rates at all levels of state microbrewery density. The mortality rate again decreases with state microbrewery density, but the presence of contract breweries dampens this legitimation effect. The overall multiplier goes below one only when there are at least 12 microbreweries in a state. The top dashed line plots the multiplier of the rate when national contract brewery density is at its maximum observed value of 114. The effect of an increase in contract brewery density from 0 to 114 results in a severe increase in the microbrewery mortality rate. In this case, the overall multiplier goes below one only when there are at least 53 microbreweries in a state.

Brewpubs.—Table 4 shows estimates of models of brewpub mortality. The basic resource-partitioning prediction of hypothesis 1b again receives support in these estimates, but here it is somewhat limited. When the concentration variable is included in the model as a constrained covariate with similar effects at all ages, it shows the expected negative effect, but it is not statistically significant (model 1). When concentration is unconstrained such that its effects might vary by firm age, then it shows a strong and significant negative effect in the first age period (see the better-fitting models, 2 and 3; the effect of concentration on the second and third age periods is positive but not significant). Apparently, the beneficial effects of resource partitioning on brewpub mortality occur primarily in the earliest years of operation, a pattern consistent with the notion that location in product market space takes on less importance here.

The form-specific density variables agree to some extent with hypothesis 3. Brewpub density displays strong and significant effects in all models, consistent with the predicted legitimating effects. (The absolute values of the legitimation effect are greater than for microbreweries.) The models also show strong negative effects for the out-of-state brewpub density variable, suggesting a broadly institutional process of legitimation of this organizational form. Except for a positive effect of microbrewery density, no other form-specific density variables or interactions affect brewpub mortality. Given the socially visible distinctiveness of the brewpub form, this pattern makes sense by the arguments of hypothesis 3.

Contract brewers.—Table 5 presents the mortality estimates for the contract brewers, the organizational form with problematic normative status. The expected negative effect of concentration appears in table 5, model 1, but it is not statistically significant. When allowed age-varying effects, however, the concentration variable shows a negative effect in early years of operation. It is also significant in the first age period in what is perhaps table 5's best-fitting model, 3. So, we again see limited support for hypothesis 1.

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	MODEL			
	1	2	3	4
Age:				
$0 < u \leq 1$	6.57	31.73*	31.82*	30.56*
	(11.55)	(15.89)	(15.86)	(16.00)
$1 < u \leq 3$	8.30	2.75	3.22	1.51
	(11.54)	(13.34)	(13.32)	(13.43)
$u > 3$	8.26	.140	.184	−.830
	(11.55)	(16.23)	(16.22)	(16.27)
ln(capacity)	−.311*	−.312*	−.310*	−.311*
	(.064)	(.064)	(.064)	(.064)
N of brewpub sites in firm	−.937*	−.926	−.927	−.931
	(.479)	(.480)	(.480)	(.481)
C4 market share[a]	−.072			
	(.121)			
C4 for age $0 < u \leq 1$		−.333*	−.337*	−.317
		(.161)	(.161)	(.163)
C4 for age $1 < u \leq 3$		.011	.003	.029
		(.145)	(.144)	(.146)
C4 for age $u > 3$		.040	.037	.055
		(.184)	(.184)	(.184)
State brewpub density	−.043*	−.048*	−.039*	−.053*
	(.018)	(.019)	(.015)	(.019)
(State brewpub density)^2				
/1,000	.097	.102		
	(.121)	(.121)		
(State brewpub density) (t_0)	.021*	.024*	.023*	.025*
	(.010)	(.011)	(.011)	(.011)
Out-of-state brewpub density ...	−.027*	−.030*	−.029*	−.030*
	(.012)	(.011)	(.011)	(.011)
National mass producer				
density	−.119	−.199	−.193	−.206
	(.101)	(.116)	(.116)	(.116)
National microbrewery				
density	.044*	.048*	.047*	.048*
	(.017)	(.016)	(.016)	(.016)
National contract brewer				
density	−.017	−.015	−.016	−.018
	(.016)	(.016)	(.016)	(.016)
(State brewpub density ×				
national contract bewer				
density)/100				.014
				(.011)
Log L	−572.7	−570.5	−570.8	−570.0

NOTE.—N of events = 163; N of spells = 2,866. Nos. in parentheses are SEs.

[a] As a % of total industry sales.

* $P \leq .05$.

TABLE 5
ESTIMATES OF MORTALITY RATES OF CONTRACT BREWERS

	MODEL			
	1	2	3	4
Age:				
$0 < u \leq 1$	6.65	12.15	39.67	21.41
	(19.48)	(22.08)	(22.04)	(23.77)
$1 < u \leq 3$	6.92	5.78	25.95	7.35
	(19.49)	(21.69)	(21.51)	(23.26)
$u > 3$	6.06	−.686	4.64	−12.25
	(19.48)	(27.35)	(26.16)	(27.34)
C4 market share[a]	−.048			
	(.214)			
C4 for age $0 < u \leq 1$		−.107	−.441*	−.212
		(.240)	(.226)	(.250)
C4 for age $1 < u \leq 3$		−.031	−.280	−.048
		(.238)	(.226)	(.250)
C4 for age $u > 3$		.033	−.046	.167
		(.313)	(.289)	(.305)
National contract density	.029	.028	.094*	.083*
	(.049)	(.049)	(.030)	(.033)
(National contract density)^2/1,000 ...	.603	.609		
	(.355)	(.357)		
National contract density (t_0)	−.014	−.011		
	(.010)	(.012)		
National mass producer density	−.136	−.151	−.188	−.191
	(.119)	(.126)	(.139)	(.139)
National microbrewery density	−.030*	−.030*	.008	−.015
	(.009)	(.009)	(.026)	(.029)
National brewpub density	.005	.005	−.023	−.021
	(.007)	(.007)	(.017)	(.017)
(National brewpub density × national contract brewer density)/100				.012*
				(.006)
Log L	−168.2	−168.0	−169.6	−167.1

NOTE.—N of events = 52; N of spells = 638. Nos. in parentheses are SEs.
[a] As a % of total industry sales.
* $P \leq .05$.

The form-specific density predictions derived from hypothesis 3 also receive support here. As expected, contract brewer density does not show any of the negative effects associated with legitimation; and, in table 5, models 3 and 4, contract brewer density shows some significant positive effects instead, suggesting that proliferation created problems as the form became known (and its inconsistent identity claims exposed). Microbrewer density does show consistent negative (legitimating) effects in models 1

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and 2, as might be expected given its normative status and its possible (mistaken) association with contract brewers. Finally, note the significant positive interaction effect between brewpub density and contract brewer density in model 4. Evidently, contract brewery mortality rises when many contract brewers are juxtaposed next to many visible examples of authentic-looking craft breweries.

DISCUSSION

The analysis reported here was designed to advance and test resource-partitioning theory, a fragment of organizational ecology theory that explains the rise of specialist organizational segments in developed industries characterized by increasing market concentration. The core of the theory predicts that, under relevant conditions, market concentration leads to higher specialist founding rates and lower specialist mortality rates (hypothesis 1). It also predicts that the resource space available for specialist organizations increases as the number of spatial dimensions expands (Péli and Nooteboom 1999).

The theoretical extensions proposed here include development of a more precise prediction about generalist organizational mortality, based on a firm's position relative to competitors with respect to scale (hypothesis 2). Using knowledge gleaned from qualitative work, we also elaborated a new interpretation of the theoretical mechanism at work in the organizational partitioning of resources, suggesting a strong role for the form-based identity claims of craftlike firms in certain consumer purchase decisions. These ideas were then linked to notions about the normative valuations of various organizational forms and examined as predictions about form-specific density dependence (hypothesis 3). Our research context was the contemporary U.S. beer brewing industry, which shows a dramatic upsurge in the number of specialist breweries over the last 15 years or so. We used resource-partitioning theory to attempt to answer the question, Why the microbrewery movement?

Summary of Findings

The systematic empirical findings from our study show again the value of basic resource-partitioning theory and suggest the merit of the extensions proposed here. Specialist organizational founding rates conform to core theoretical predictions (hypothesis 1a), with the emergence and spread of organizational forms associated with the microbrewing movement increasing with overall market concentration.

The founding rates also support the form identity arguments of hy-

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pothesis 3. For the two forms that pass normative valuations tests relative to identity claims (microbreweries and brewpubs), density interactions of the two forms' densities exert positive effects on founding, suggesting a mutually enhancing legitimation process. For the counternormative contract brewers, the density interactions vary in effect: contract brewer density interacts with the density of difficult-to-distinguish microbrewery form to raise founding rates while it interacts with the socially visible brewpub density to lower them. Apparently, the presence of the visible and obviously authentic brewpub form accelerates negative normative valuation of contract brewers when many organizations of both forms are present.

The mortality rates of mass production (generalist) breweries show many of the usual patterns of density and age dependence as well as a strong and significant effect of scale competition from larger firms (hypothesis 2). This finding accords well with the recent failures and troubles of "smaller" mass producers such as Evansville Brewing, Stroh, and Heileman. It also agrees with the assessment of industry leaders, such as Paul Shipman, CEO of Redhook, who noted that the problem with small mass producers (medium sized in the overall distribution of all brewers) is that they are "too big to be small, and too small to be big" (quoted in Kitsock 1999, p. 65; see also Dorsch and Kitsock 1999). Theoretically, the finding presents a new twist on an emerging approach to modeling competition that has potentially broad application beyond resource partitioning theory and organizational ecology (see Dobrev and Carroll 2000).

Patterns of specialist organizational mortality differ by organizational form. For microbreweries, mortality declines strongly with concentration, as the core theory predicts (hypothesis 1b). So too does brewpub and contract brewer mortality, but only significantly for firms in their early years. These slightly diminished effects of concentration are also consistent with our general claim that something beyond location is occurring here, something more sociological.

Density-based legitimation effects on specialist mortality show many of the expected patterns (hypothesis 3). For microbreweries and brewpubs, own density shows a strong and significant negative effect, suggesting that the form becomes legitimated as it proliferates. By contrast, the contract brewers show no evidence of legitimation from density.

The "cross-effects" of the specialist form density variables on the mortality of other forms also often support hypothesis 3. For microbreweries, the contract brewer density shows both a positive main effect and interaction effect, suggesting the counternormative form slows the legitimation of its not-readily distinguishable cousin. By contrast, the socially visible brewpub form shows only a single cross-effect, that of microbrewery density. For contract brewers, the cross-effects show striking parallels to the

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founding rates: microbrewer density shows negative (legitimating) effects, while brewpub density shows a positive interaction effect with contract brewer density. So, mortality among contract brewers rises when many of them encounter many visible examples of authentic-looking craft breweries using the brewpub form.

In general, these findings agree with our qualitative work, which convinced us initially that craftlike form identity plays a critical role in the appeal and life chances of specialist breweries. Recent industry trends of strategic alliances between major breweries and microbrewers and the acquisition of brewing plants by previous contract brewers (itemized above) also support this view.

Identity Issues

Clearly, however, in many organizational and industrial contexts, form identity does not pose the same constraints to large mass production firms that it does in contemporary U.S. beer brewing. In some, such as automobile production, large companies seem to have little trouble developing upscale product lines, such as Toyota and Honda did with their Lexus and Acura divisions. In others, such as airline passenger service, large companies apparently do not find it economically feasible to enter many of the peripheral markets. But the alliances they make with the commuter airlines serving these markets often trumpet the larger company's identity and repress the small specialist identity, such as United Express (affiliates of United Airlines) and American Eagle (affiliates of American Airlines).[26] In yet others, such as music recording, film production, and book publishing, many large companies have succeeded in operating and developing viable small semiautonomous subunits with separate names and identities, such as Twisted Records (MCA), Miramax Films (Disney), Fox Searchlight Pictures (20th Century–Fox), and Schocken Books (Random House), to name just a few. Although these subunit arrangements are sometimes problematic for certain musicians, directors, actors, and writers (who still resent the background corporate control), they frequently work well, provided sufficient autonomy and local control is granted.[27]

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[26] United also operates Shuttle by United, which serves higher volume markets than the United Express carriers.

[27] The interesting identity problem that sometimes develops in these arrangements involves the specialist subunit developing products and engaging in behavior that reflect negatively on the larger corporation, such as Time-Warner's experience with the lucrative but criminal "gangsta rap" label Death Row Records (eventually sold) or Universal Pictures' experience with October Films and its critically acclaimed but controversial movie dealing with pedophilia, *Happiness* (eventually abandoned). The identity constraint here keeps large firms out of these markets not because the con-

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To address these and related issues, we believe that significant further theoretical and empirical exploration into organizational form identity and other sociological processes underlying resource partitioning is warranted. In our view, the location-based crowding mechanism of the original theory can only explain fully some of the industries where resource partitioning occurs. The best case is perhaps the airline passenger service industry (Seidel 1997), where location has a specific geographical meaning. Many other industries with resource partitioning are similar to beer brewing in that the sustained appeal of specialist organizations appears to emanate from their identity. Plausible cases here include music recording, book publishing and newspapers. In a third set of industries, closely related mechanisms involving the conspicuous status consumption of specialty firms' products appear to be at work. The best example is the wine industry (Swaminathan 1995, 2000). Finally, in a fourth set of industries, the position of specialist firms seems to be sustained by their flexibility over time. This dynamic capability allows specialist firms to meet the unique and changing needs of certain clients and other customers. A good example here is the auditing industry (Boone et al. 2000). Conditions for operation of one or the other partitioning mechanisms have yet to be delineated, and the implications of each for theory, research, and practice are yet to be fully developed. These are important tasks for future scholarly work on resource partitioning. Nonetheless, it is already obvious that each of these latter mechanisms has a stronger sociological character than the original location-based mechanism, which bears a resemblance to some economic models.

Size and Impact

Despite our efforts here to portray the rise of specialist organizational segments as important to understanding fundamental industry dynamics, we realize that some social scientists continue to question the value of studying small organizations. In our opinion, these views typically confuse the sizes of organizations with the social and economic roles that they play. Consider again the beer brewing industry—its market was virtually stagnant before the microbrewery movement. Specialty brewers tapped new beer business, bringing in new customers for as much as half of their markets (Backus 1999). The rise of small specialty breweries has also coincided with enhanced consumer choice in the marketplace, significant new product innovation, and an expansion of employment opportunities.

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sumers of specialty products reject them (as with beer), but because the consumers and other publics of the larger public company reject or condemn the association with the specialty subunit when it engages in the kind of activity needed to be successful in the specialty niche.

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According to some data, specialty brewers have profit rates higher than the industry average (see Institute of Brewing Studies 1996; Beer Institute 1997).[28] The sustained viability of these breweries and their many diverse manifestations have changed dramatically the competitive environment faced by the mass production breweries. Whereas these large companies used to confront only a few like-minded competitors, they now also face hundreds of specialist competitors, many of whom have high status and great appeal among the more affluent consumers in the market. The mass production brewers have already seen much of the market for their high-end products, the so-called superpremium beer category, erode because of competition from the microbreweries (Van Munching 1997). Given the fickle nature of beer tastes, there is also the very real possibility (fear for some) that the market will turn even more in the direction of microbrewed products.[29]

Small size often does not mean trivial impact, especially for consumers. This point is illustrated well by returning to our opening comparison of the contemporary German and U.S. brewing industries. While the two industries have indeed become very similar in terms of the number of breweries, they still differ a lot in their size distributions. Many small and tiny firms populate the U.S. industry, while the German industry has a bigger set of intermediate size firms. The beer markets of both countries are characterized by a healthy amount of product diversity, but we venture with confidence that the U.S. market vastly outdoes Germany on this dimension. U.S. breweries now produce most of the German styles of beer, and they also make all sorts of other malt beverages that are hard to find in Germany, including those of British, Belgian, and indigenous origins. These products mainly come (at least initially) from small and tiny U.S. breweries.

Comparative Issues

Comparative differences in consumption patterns reflect in part these kinds of variations in the organizational structure of the producer population. But there is clearly more to the comparative story when craft identity is the driver for small specialist firms. What strikes us as particularly fascinating is how cultures differ in the product domains where

[28] For instance, the Institute of Brewing Studies (1996) reports a survey showing 1994 means for after-tax return on sales (net income after taxes divided by gross revenue) as 8% for microbreweries and 12.1% for brewpubs. The industry average for all breweries in 1994 was 4.8% according to the Beer Institute (1997). Selective reporting is, of course, a serious potential problem with these data.

[29] One recent expert prediction forecasts a 20%–25% market share for craft brewers (Jackson 1999).

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craft identity possesses an appeal or not. For example, numerous entre-
preneurs think that microbreweries have a rosy future in China, where
beer is a popular drink. But many also generally agree that successful
marketing of microbrewed beer to Chinese drinkers requires a very dif-
ferent orientation, one that emphasizes modern technology and quality
control rather than traditional craftsmanship and 18th- or 19th-century
authenticity. The South China Brewing Company in Hong Kong, where
we conducted extensive interviews, goes so far as to use two radically
diverging approaches to potential customers from the British-American
expatriate community on the one hand and the ethnic Chinese population
on the other. As the general manager of this brewery told us:

> It's a fine line we have to walk with the Chinese. When we first started,
> the Chinese literally thought we were doing this in our basement. They
> thought it was home brewed. And so they didn't want to deal with that
> . . . So on that side, we kind of pushed the yeah, we're small but are high
> tech. Everything is new, everything is custom-made to our specifications.
> The level of our sophistication, of our equipment, is the same as what's up
> in the new San Miguel brewery. . . . With the expats, we go a lot more
> with the it's hand-crafted, no chemicals, no pasteurization, it's all natural.
> So it's totally two marketing approaches. (Ashen 1996)

We can think of several general reasons why Chinese consumers might
prefer modern technology to traditional production methods for products
such as beer. The most intriguing has to with the recency and irregularity
of economic and social development in locations like Hong Kong. Unlike
in the United States, where the virtues of traditional production get ro-
manticized, in places such as Hong Kong it is remembered personally and
vividly by many as the source of quality imperfections, higher costs, and
inaccessibility.

This observation does not, however, imply that the craftlike identity
of the small specialist organizational form has no appeal in these societies
or that there is no reaction against mass society. Our speculation is that
the process likely plays itself out in consumption of other products. In
countries such as Hong Kong, Taiwan, and Singapore we speculate that
one domain might be the tea industry, where the appeal of obscure rare
"gourmet" teas appears to be increasing and has given rise to a number
of traditional tea shops offering high-priced teas from small specialty
producers served with precise and elaborate procedures. Why for a given
culture any particular product becomes the focus of this sociological pro-
cess is not a question that we can answer at this point—we are prepared
to believe it can only be addressed interpretively and that it might be
idiosyncratic in nature. We do think, however, that once such a domain
is identified we have come some ways in understanding the organizational
dynamics that will unfold.

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APPENDIX

TABLE A1

Descriptive Statistics, Event-Count Data, Specialist Brewery Foundings

Variable	Mean	SD	Min	Max
C4 market share[a]	47.457	26.462	12.6	90.4
Specialist density	72.733	203.452	0	1,131
Microbrewery density	28.483	74.986	0	419
Brewpub density	35.517	106.195	0	598
Contract brewery density	8.733	22.751	0	114
Real per capita disposable income[b] ...	9.400	3.269	4.213	15.312
Post-Prohibition industry age [c]	34.5	17.464	5	64

NOTE.— $N = 60$.

[a] As a % of total industry sales.

[b] Real per capita disposable income is given in thousands of constant 1987 \$U.S.

[c] Post-Prohibition industry age is calculated by (calendar year$-$1933).

TABLE A2

Descriptive Statistics, Event-History Data, Mass Production Brewery Mortality

Variable	Mean	SD	Min	Max
Density	379.124	188.019	43	1,154
Density (t_0)	736.437	397.892	22	2,798
Mass producer density	369.485	190.249	22	694
Mass producer density (t_0) ...	735.286	399.354	22	2,798
Microbrewery density	3.893	28.246	0	419
Brewpub density	4.605	39.463	0	598
Contract brewery density	1.140	8.598	0	114
Capacity[a]	927,230	4,609,264	580	98,600,000
D_{it} (ASDLO)	5.660	33.679	0	1,096.25
Tax paid withdrawals[b]	84.109	29.350	51.817	182.819
Real GDP[c]	1,734.90	928.072	770.642	6,043.89
Operating in 1938	.954	.210	0	1

NOTE.— $N = 10,648$. ASDLO stands for aggregate size difference of larger organizations.

[a] In barrels of production capacity.

[b] In millions of constant 1987 \$U.S.

[c] In billions of constant 1987 \$U.S.

TABLE A3

Descriptive Statistics, Event-History Data, Microbrewery Mortality

Variable	Mean	SD	Min	Max
Capacity[a]	12,153	39,913	12	500,000
C4 market share[b]	88.304	5.139	31.6	90.4
State microbrewery density	12.720	14.072	0	57
State microbrewery density (t_0)	9.511	11.878	0	70
Out-of-state microbrewery density ...	206.705	133.576	0	418

TABLE A3 (*Continued*)

Variable	Mean	SD	Min	Max
National mass producer density	24.924	8.393	22	175
State brewpub density	15.930	21.590	0	90
National contract brewer density ...	66.198	37.594	0	114

NOTE.— $N = 2{,}194$.

[a] In barrels of production capacity.

[b] As a % of total industry sales.

TABLE A4

DESCRIPTIVE STATISTICS, EVENT-HISTORY DATA, BREWPUB MORTALITY

Variable	Mean	SD	Min	Max
Capacity[a]	1,585	2,498	1	56,975
Brewpub chain organization[b]	.207	1.116	0	21
C4 market share[c]	89.398	1.377	77.9	90.4
State brewpub density	19.475	22.511	0	90
State brewpub density(t_0)	17.058	20.460	0	109
Out-of-state brewpub density	319.201	188.457	0	597
National mass producer density	23.613	1.307	22	33
National microbrewery density	242.296	131.580	10	419
National contract brewer density ...	72.892	34.280	0	114

NOTE. —$N = 2{,}688$.

[a] In barrels of production capacity.

[b] N of units.

[c] As a % of total industry sales.

TABLE A5

DESCRIPTIVE STATISTICS, EVENT-HISTORY DATA, CONTRACT BREWER MORTALITY

Variable	Mean	SD	Min	Max
C4 market share[a]	88.957	1.793	81.3	90.4
National contract brewer density	63.329	35.140	0	114
National contract brewer density (t_0) ..	51.514	34.530	0	114
National mass producer density	24.003	1.977	22	32
National microbrewery density	206.498	131.640	21	419
National brewpub density	284.687	194.694	3	598

Note.— $N = 638$.
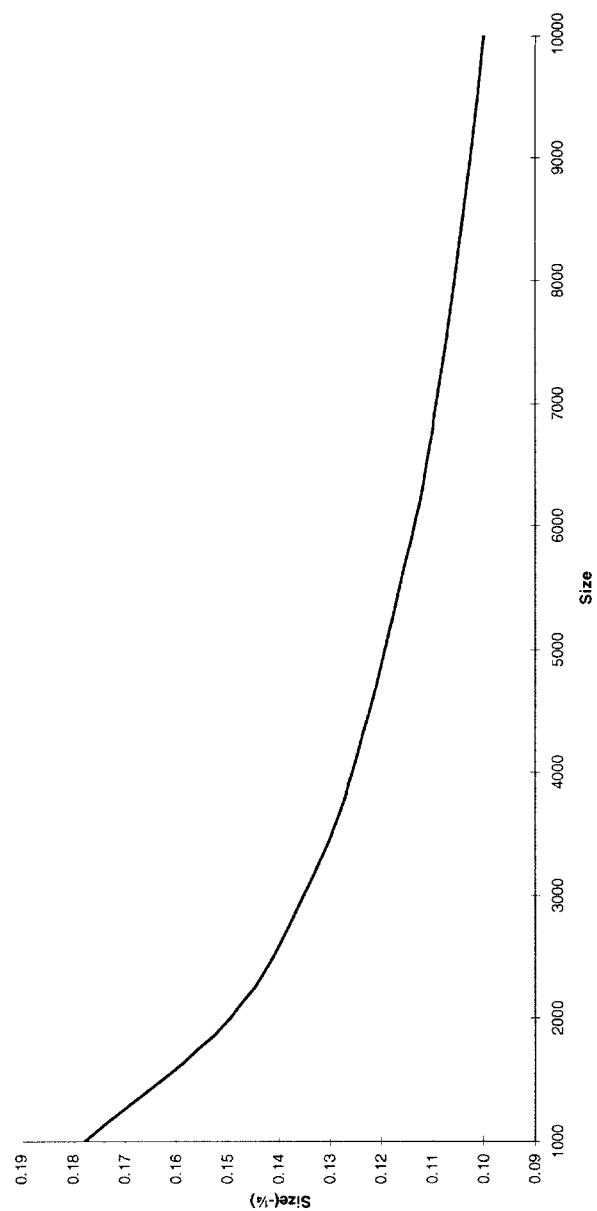
[a] As a % of total industry sales.

756

Fig. A1.—Transformation used to approximate long-run average cost curve

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