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**ON THE TRAIL OF FINE ALE:
THE ROLE OF FACTOR CONDITIONS IN
THE LOCATION OF CRAFT
BREWERIES IN THE UNITED STATES**

A Thesis
Presented for the
Master of Science
Degree
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James Daniel Baginski
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ABSTRACT

Since their origin in the late 1970s, craft breweries have diffused throughout the United States, greatly changing American perceptions of beer in the process. The manner in which craft breweries have spread throughout the nation has not been ubiquitous; at all scales of analysis, a great deal of variation exists. Some areas are far more developed than others in terms of the number of craft breweries present. The data indicate that, while population does play a role in influencing the development of craft breweries, other sociological and demographic conditions also appear to be of great importance in explaining the spatial distribution of these breweries.

This thesis examines the relationship between craft breweries and many factor conditions in an attempt to pinpoint the factors which are most closely associated with the provision of craft breweries. Beginning at the national scale, the focus is narrowed down in scale, including regional, subregional, state and, finally, metropolitan levels. At the state and metropolitan levels of analysis, regression models are developed in an attempt to determine the factors that influence craft brewing development to the greatest degree. Additionally, marketing techniques are examined in an effort to better understand locational variations of how craft beers are being marketed.

The results of the state-level analysis suggest the importance of a number of factors which influence the degree of craft brewing development. At the state level, the presence of highly educated residents, the extent of intrastate hierarchical diffusion of craft breweries to non-metropolitan areas, and the per capita state expenditures are among the variables related to the degree of craft brewing development. At the metropolitan scale, median household income, the extent of wage inequality, the provision of arts and

culture, the presence of crime, the percentage of highly educated residents, the relative emphasis placed on education, cost of living, and general quality of life are the variables that exert the greatest amount of predictive power over the number of craft breweries per capita in a metropolitan area. At both state and metropolitan scales, the limited effect of raw population numbers in influencing the number of craft breweries is apparent. The results also indicate, however, that there are many other, immeasurable factors that influence the extent of craft brewing to a greater degree than any of the independent variables included in the model were able to capture.

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CHAPTER 1

1.1 Introduction

The steady decline in the number of breweries in the United States throughout most the twentieth century reached its low point in 1983 when only 43 facilities were in operation. The downsizing was the result of corporate consolidation, a trend predicted at the time to continue to shrink the industry (Porter 1980). Despite the forecasted continual reduction of breweries, the brewing industry after 1980 instead erupted and small-scale breweries emerged at a rapid rate. By 1997, the United States surpassed Germany in breweries per capita with a total of over 1,200 breweries in operation (Carroll and Swaminathan 2000). The growth trend continued until, by the end of 2006 there were 1,389 craft breweries in the United States (Brewers Association 2007)¹.

The goal of this thesis is to better understand the factors necessary for a craft-brewing operation to be successful at a particular location. Among the research questions to be answered are:

- How have craft breweries diffused geographically in the United States since the phenomenon began in California in the late 1970s?
- Which parts of the country are more established in the craft-brewing industry and why are some regions more successful than others?
- What are the necessary factor conditions for brewing operations to flourish in their respective locales?

¹ For a detailed description of craft breweries and other related terms, please consult Appendix One.

After first providing an overview of regional variations in craft brewing, this research will then examine the craft-brewing industry at the state level, examining the existence of breweries in each state based on a number of variables hypothesized to be related to the size and growth of the industry. The focus will then shift to a more geographically fine-grained (i.e., larger) scale by looking at the amount of craft brewing in each of the 331 Metropolitan Statistical Areas (MSAs) in the United States.*

The extent of success in the craft brewing industry for each MSA will be compared to its respective scores based on several indices, according to the 2004 edition of Frommer's *Cities Ranked and Rated*, The United States Bureau of the Census, and *The Rise of the Creative Class* (Florida 2002), with the goal of finding out how strongly a particular city's strengths are associated with its provision of craft-brewed beer. The data indicate that while population alone is one explanatory factor, it does not appear that the craft brewing phenomenon is solely population-driven. To account for the differences in population among metropolitan areas, an adjusted measure of 'number of breweries per 100,000 residents' will be employed as the dependent variable in the MSA-level analysis. By accounting for the effects of population, the influences of other demographic and cultural characteristics present in the metropolitan areas should be much more visible.

1.2 Getting Crafty: The Emergence of American Craft Brewing

Following the onset of consolidation in the brewing industry after the repeal of Prohibition and the subsequent decline of the number of firms in the brewing industry,

* *Cities Ranked and Rated* uses the old US Census Bureau designation of metropolitan statistical areas (MSAs), where constitutive Primary Metropolitan Statistical Areas (PMSAs) are included independently of their agglomerated Consolidated Metropolitan Statistical Area (CMSA).

most economists believed that the atrophy in number of breweries would continue to occur. In 1910, the four largest brewing companies held less than 10% of the total market share compared to greater than 80% by the 1990s (Carroll and Swaminathan 2000). Michael Porter (1980, p. 9) cited the brewing industry as a prime example of an industry in which it would be difficult for an upstart to gain a foothold, stating: “In the brewing industry, product differentiation is coupled with economies of scale in production, marketing and distribution to create high barriers.” Porter’s prediction has held true for generic producers as regional non-craft breweries such as Rolling Rock continue to be absorbed by corporate mergers with industry giants such as Anheuser Busch (Boselovic 2006). The brewing industry has experienced a period of dramatic growth for more than twenty years, however, in the form of smaller-scale producers, often termed craft breweries.

A century ago, competition between local breweries and their larger rivals played out very differently than the competitive nature of the industry today. Today, the large national breweries tightly control market penetration through prohibitive distribution controls, preventing distributors from marketing the products of smaller operations (Kesmodel 2007). Prior to Prohibition, local brewers were able to guarantee their own successes by direct bar and saloon ownership, creating an environment of uncontested sales to consumers (Stack 2000). Following Prohibition, changes in the legal code generally required beer to be sold through distributors which, in turn, benefited the larger producers. This was done in order to prevent the beer producers from restricting consumer choice via owning and controlling bars and saloons as had been the case prior to Prohibition (Kesmodel 2007). As a result, these distributor requirements created

difficulties for the smaller craft brewers because the large brewing conglomerates kept them out of potential markets. Small batch producers sought alternative distribution channels as their products continued to grow in popularity and as this type of brewery continues to gain more influence and popularity in the larger beer market (Kesmodel 2007).

In addition to the legal issue, several specific factors of modernization encouraged economies of scale in the brewing industry. First, improvements in transportation enabled producers to penetrate distant markets. Modern refrigeration and pasteurization led to a significantly longer lifespan of the finished product, increasing the possibilities of expansion to distant markets. Finally, increased expenditures in advertising led to a more widespread brand recognition (Johnston 1993). Despite the reversal of the power structure from approximately one hundred years ago when smaller breweries controlled localized distribution and sales, the existence of competition between localized operations and the larger regional and national breweries has deep roots in America.

1.3 The Origins of Craft Brewing

Disagreement exists about the specific origin of the “boutique brewing renaissance” that began in the latter half of the twentieth century. One commonly held belief is that Fritz Maytag, heir to the giant appliance company, was responsible for the radical shift in brewing techniques. Maytag purchased the then-struggling Anchor Brewing Company in 1965, and opted to revert to a more traditional brewing technique

by producing an all-malt beverage, devoid of any adjunct ingredients² or preservatives (Tremblay and Tremblay 2005). Some argue that Maytag's shift in brewing techniques cannot be credited with the founding of the craft brewing movement because the production facility was not new or unique—the Anchor Brewing Company's history was not devoted to craft production. Rather, its history dates back to 1896 when it served as a regional brewery with a capacity for 50,000 barrels worth of production, which was typical of the era.

Another credible argument related to the birth of the craft brewing movement is that John McAuliffe was responsible for the phenomenon (Johnson 1993). This argument asserts that a more organic process occurred, where McAuliffe used his knowledge and acquired tastes of beer from his overseas military service to later begin brewing beer when he returned to the United States. After gaining experience through the home-brewing of ales and stouts, he entered the market as the first distinctly craft brewer through the founding of New Albion Brewing Company in Sonoma, California (Tremblay and Tremblay 2005). Regardless of which of the two genesis myths is embraced, the two “potential” founding sites of American craft brewing are related in their geographic proximity. Both Anchor Brewing Company and New Albion Brewing Company are located in central coast region of California.

² Adjunct ingredients such as corn and rice are frequently added in the brewing process by large, mega-producers. The use of these unmalted ingredients does not adhere to the German beer purity laws, and craft brewers, as a general rule, steer clear of using such ingredients, which actually tend to thin the texture of beers.

1.4 A Chink in the Armor: Yearning for Authenticity

Although the majority of beer sales are still controlled by large producers such as Anheuser Busch, Miller, and Coors, a niche has developed on the fringes of the market, catapulting hundreds of smaller, more local producers into the market (Flack 1997). One factor that led to the demand of craft beers was the seemingly homogenous taste of all mass-produced beers to an extent that in blind taste tests, consumers were unable to differentiate their favorite brands from other competing labels. Blandness and homogeneity of taste, coupled with a backlash against large corporations, helped pave the way for the growth of smaller beer producers (Carroll and Swaminathan 2000). The distaste for large corporations has, in turn, enabled microbreweries to be used as “tools of local identity.” (Schnell and Reese 2003). Tuan (1980) attributes this American distaste of a homogenous, national culture to the frequent migrations to and from places with distinct local cultures. Similarly, Florida (2002) observes the difference between authenticity and generic. Members of what he has labeled the “creative class” shun the mass-produced “generic” products and services in favor of authentic creations. Furthermore, one of the central themes of this creative class argument is geographic mobility, where talent tends to seek out locales with a high quality of life, authenticity in the local culture, availability of outdoor recreational activities, and active downtown streets (Florida 2002, McGranahan and Wojan 2007).

1.5 Craft Brewing: What is It?

According to Paul Gatza (2007), director of the Brewers Association, craft breweries are characterized by a three-part definition, where size, independence, and

traditional production methods are the component constructs. First, the size of a brewery is measured by the total number of barrels produced annually. In order for a brewery to meet the craft designation, it must produce less than two million barrels of beer per year. Based on production volume, these breweries qualify for the Tax and Trade Bureau's "Small Brewers Excise Tax Differential." This tax differential, a shift in federal governmental policy, is necessary to understand one of the most influential factors leading to a resurgence of small breweries in America. In 1977, a change in the national brewing taxation scheme opened the door for small-market brewers. Prior to the change in taxation, all brewers were subjected to an excise tax of \$9.00 per barrel. The alteration of the law granted brewers selling less than two million barrels of beer annually an excise tax rate of only \$7.00 per barrel for the first 60,000 barrels of beer sold in a given year. Because, by their nature, craft brewers produce their product in much smaller batch sizes, most breweries in the years following the change in the tax code were not subjected to the standard rate of \$9.00 per barrel because they did not produce in excess of 60,000 barrels annually. The effects of the new law can be gauged by the time when the first craft breweries built from the ground up came into being: immediately following the creation of the new law.

While the initial change in legislation was undoubtedly an impetus for the founding of smaller breweries, a subsequent change in brewing laws further helped the "little guys" to compete against the larger brewers. In 1991, the standard excise tax for large brewers was doubled (from \$9.00 to \$18.00 per barrel), while the previous levy of \$7.00 per barrel for the first 60,000 barrels produced by firms with an output not exceeding two million barrels annually continued. The results of this change are striking

when comparing the percentages of costs accounted for by excise taxes of beer sold. The mass-producers taxation rate accounted for 29% of the costs, compared to only 5% for small, specialty producers (Import Specialty Insights 2001).

Additional measures of legislation have also been influential in aiding the development of craft breweries. One such example was the introduction of a bill that legalized home brewing that was signed into law by President Jimmy Carter in 1979 (Johnson 1993). The law enabled any singly-headed household to produce up to 100 gallons of beer annually, and homes with two or more adults were permitted to brew up to 200 gallons of beer per annum. Johnson (1993) asserts that the legalization of home-brewing was also influential in encouraging entrepreneurship in the brewing industry. Specifically, home-brewers eventually established commercial operations after they had obtained the necessary skills and confidence of brewing in a heretofore private setting. To put it another way, Wolf (2007) stated that, after brewing in the comfort of their own homes, “Basement brewers had so much fun that many of them went pro”. It would be difficult for one to imagine that the practice of home brewing did not occur prior to its legalization. However, the legalization of home-brewing subsequently made the necessary ingredients and other inputs much more easily accessible as home brewing supply stores sprung up to supply the needs of home brewers.

Secondly, the craft brewery must be independent, which is defined as having less than 25% of its operation being controlled by another producer of alcoholic beverages that is not itself a craft brewer. This component of the craft designation excludes the segment of would-be craft breweries that are controlled by a brewing conglomerate. Furthermore, this portion of the craft brewing definition prevents producers from

establishing additional brewing operations in an attempt to give consumers the false impression that a particular brew is completely independent of the mega-producer (Carroll and Swaminathan 2003). Examples of brewing conglomerates attempting to distance themselves from their widely recognized labels include the Blue Moon Brewery (owned by Coor's) and the Plank Road Brewery (Miller).

Finally, a craft-brewing operation must produce its beer with a minimum of one-half malted barley, and any additional additives must be flavor enhancers. This is in contrast to the brewing processes of the average mass-produced domestic brewing technique that use 25-65% adjuncts such as corn or rice in place of malted barley (Tremblay and Tremblay 2005). The belief that superiority in the creation of beers is achieved through the use of malted barley is rooted in *Reinheitsgebot*, the German beer purity law. Because of the present American craft brewers' adherence to "the commandment for purity" in brewing, this third portion of the craft-brewed definition serves as a source of pride and marketing leverage for American brewing craftsmen (Tremblay and Tremblay 2005).

1.6 Innovation Mixed With Tradition

In addition to the three components defining craft brewing, Gatza (2007) points out that there are several other important identifying characteristics of craft brewers, with one of the most important being innovation. Using historic brewing methods, craft brewers add their own signature uniqueness to such styles to create beers that have no precedent. While the relationship between 'innovation' and the 'use of historic brewing methods' initially appears contradictory, even oxymoronic, the marriage between the two

concepts—tradition and innovation—does, however, make sense when put into practice. The reinterpretation of old brewing methods has grown in popularity for craft brewers, sidestepping the largely streamlined, standardized processes employed by the largest American brewers. Brewers are using historical styles and techniques, and putting unique twists on them to create matchless products that do not fit neatly into a specific stylistic category.

Craft-brewed beer is made with malted barley, and brewers frequently add attention-grabbing, non-traditional ingredients (e.g. raisins in Dogfish Head's Raison d'Etre, apricots in Magic Hat's # 9, chocolate in Brooklyn Brewery's Chocolate Stout). Florida (2002) views innovativeness as a product of the openness of a region and its fostering of diversity, providing insight into a potential underlying factor of varying success rates of craft brewing in different regions.

1.7 Craft Brewers as Good Citizens

Finally, Gatza (2007) states that brewers of craft beer are distinguishable from their non-craft counterparts by their involvement in community activities, such as philanthropic events, donations, volunteering, and sponsoring events. Involvement in the local communities in which craft breweries are situated is related to the potential markets of respective breweries, serving as a means to promote a positive image and community-oriented attitude, as well as providing an avenue for local brewers to benevolently give back to their respective communities. Examples of this include beer classes, beer appreciation seminars, and periodic specialty dinners, thus bringing community members together to share the local beer culture and learn more about the increasing diversity of

beer, such as its rising role as a substitute for wine at the dinner table (DiNardo 2008). With their deeper pockets, mega-brewers are able to achieve this image-marketing technique on a much larger scale. One such example of this is the Miller Brewing Company's investment of advertising revenue to show how the brewery can be beneficial to communities by switching their normal beer distribution to bottled water handouts in disaster areas. In both cases, the scale of the brewing operation is proportional to its potential market and scale of image-promoting activities.

1.8 Applications of Theory: How Did Craft Brewing Get Its Foot in the Door?

One explanation of the growth of small market craft breweries is based on resource partitioning theory (Carroll and Swaminathan 2000). This theory posits that as an industry matures, large generalist firms come to dominate the large, core segment of the market. These corporations are able to use their comparative advantage and high barriers to entry to dominate the majority of the market. This allows for specialist firms to emerge and serve consumers outside of the generalists' control while avoiding direct competition. In the case of the beer industry in America, the specialist firms have answered the calls of consumers who no longer accept the bland, homogenous tastes produced by the generalist organizations. The degree of resource partitioning in a particular industry is directly proportional to the number of specialist firms that subsequently emerge, providing further evidence of why the microbrewery movement has experienced massive growth (Swaminathan 1998).

Another important consideration pertaining to craft brewery development is the variations in levels of regional economic development. Because craft-brewed beer is

more expensive than its non-craft counterparts (Tremblay and Tremblay 2006), the economic performance of a particular region may influence its level of craft brewery development. Using Economic Areas (EAs) as the scope of his focus, Porter (2003) evaluates the changes in average wages between 1990 and 2000. He finds differences of greater than 2.5 times among EAs, indicating the large disparities among inter-regional wealth within the United States. These significant variations in relative wealth may be of great importance in understanding regional variations in levels of craft brewery developments, where regions with higher incomes should be expected to have more craft breweries than areas at the lower end of the regional income spectrum. Coinciding with regional economic differences are varying local demand conditions. Porter (1990) identifies local demand conditions as being a key component of an area's ability to foster successful industry. The important local demand condition to the craft brewing industry is the sophistication of the potential buyers. Porter states that the sophistication in the demands of local buyers influence the production of higher quality goods, which, in turn, can be competitive in outlying markets. This could serve as an explanatory factor in the ability of north central Colorado's agglomeration of craft breweries to produce beers that are competitive in distant markets.

1.9 The Long Tail

Anderson's (2004) concept of "The Long Tail" helps to interpret the drastic shift in consumer preferences and behavior, and how people are now, more than ever before, able to realize that their tastes may not be considered mainstream. "The Long Tail" can be defined as the small niches in a larger market that grow in popularity as alternatives to the

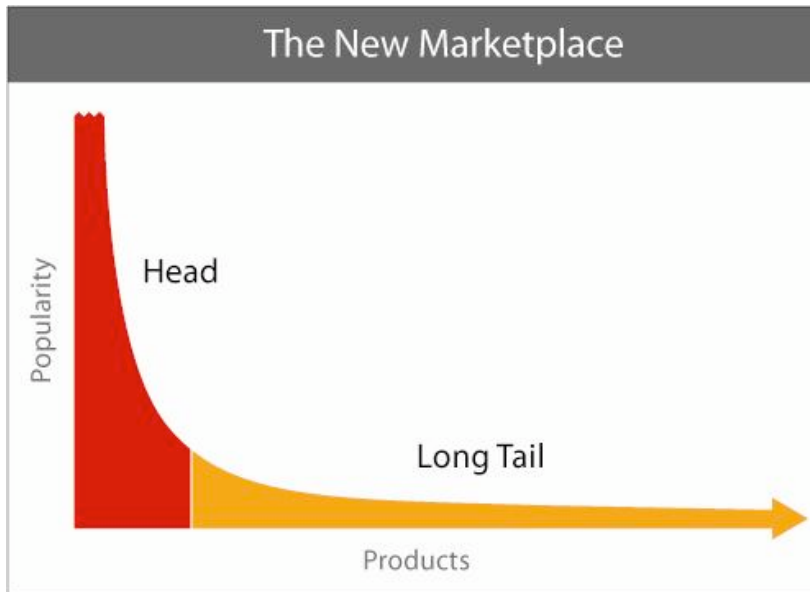


Figure 1.1: The Long Tail

Source: www.thelongtail.com

mainstream become options for consumers. Figure 1.1 represents the distribution of product options and depicts the long tail at work. The darker shade on the left side of the graph shows how half of a product's sales are confined to a few producers in large quantities, while the other half of the products sales are distributed down the "long tail" in small quantities. While Anderson focuses his attention on music, movies, and books, the lessons to be learned from his analysis can easily be transferred to the subject of beer in America. As the availability of alternatives has increased in the beer world, drinkers are no longer being influenced as strongly by marketing and the concept of a "hit-driven culture."³ If they were, the beer market would be even more heavily controlled by the few large producers. Just a few decades ago, alternatives to the mainstream beer supply did

³ The term "hit-driven culture" is primarily in reference to the music industry, where only the most popular songs (or hits) are known by the average listener. This has traditionally been the way the music industry has operated. Similarly, for the time starting at the end of Prohibition and continuing until the beginning of American craft brewing, beer consumers choices in stores were limited to only the most popular of labels (Budweiser, Coors, Miller, etc.).

not exist. But now that craft-brewing has emerged and established solid roots in American culture, the growth in its popularity serves as proof that an increasing number of Americans are becoming part of the “long tail” of beer demand. The “long tail” of options created by American producers supports an increasingly diverse array of beer choices for consumers. Michael Jackson (Johnston 1993: V) notes that the widest range of beer styles is no longer found in Europe where specific regions stick to specific styles, but on the continent of North America, where classical European beers are now being challenged and surpassed by American brewers.

1.10 The Culture of Refined Tastes

Coinciding with Anderson’s analysis of shifts in the preferences of consumers are several important characterizations of the nature of the retail world today. Bourdieu (1984) suggests that one’s cultural needs are the byproduct of both upbringing and educational attainment. The extent of influence of “highbrow” cultural attributes (e.g. museum visits, concert attendance, and reading) are directly related to the amount of weight given to them through the avenues of formal education and upbringing. The relative weight of the varying degrees of these social perceptions thus creates a social hierarchy in the world of consumers. Throughout Bourdieu’s framework, the area of underlying importance is how individual tastes and preferences obtain ‘class’. As the complexity of beer tastes increase (from light, homogenous lager beers to beverages with much bolder flavors and a much wider array of ingredients) and consumers’ perceptions of the integrity of small-batch, craft products rise, Wolf’s (2007) assertion that beer, “...has moved from the House of Commons to the House of Lords” rings true. For this

reason, craft-brewed beer can be viewed as an imperfect substitute for mass-produced beer. The varying flavors, colors, and textures make craft beers a unique category within the larger beer market (Tremblay and Tremblay 2005). To the more cultured consumer of beers, the bland, homogenous tastes of mass-produced brews are not a substitutable alternative to craft beers. The increasing presence of beer sommeliers at upscale restaurants serves as further proof of the increasingly “cultured” importance of beer in America. Livingston, Montana’s Neptune Brewery’s slogan makes the distinction between drinking beer to get drunk and drinking beer for the sake of appreciating the quality product by stating, “Don’t drink like a fish...drink like a God.” (Neptune Brewery website 2008).

1.11 The Emergence of the Modern American Consumer Society

The role of consumer culture in America cannot be understated, as it accounts for approximately two-thirds of national economic growth, or \$3 trillion per year (Zukin 2004). Beginning in the 1960s, producers and media outlets sought to promote products of specific brands and labels as a means of creating an individual identity, social status, and a feeling of belonging within the larger national culture (Zukin 2004). Simultaneously, a sizable portion of Americans’ infatuation with counterculture spurred the emergence, “...of an underground retail sector of granola, acid rock, and “head shops” into the corporate economy of Whole Foods, Tower Records, and The Gap” (Zukin 2004: 16). The latter portion of the period that Zukin writes of is the time in which American craft brewing began. The relationship between the transforming culture of consumption and the popularity of a new “beer culture” is easily discernable. Craft-

brewed beer is more expensive than mass-produced beer, providing evidence of how beer preferences relate to social class differentiation. Similarly, opting for an obscure, small-make beer can serve as a symbol of individual identity in a society where the large majority (90%) of consumers purchase one of three corporate labels: Miller, Anheuser Busch, and Coors. The notion that “counterculture is cool” also plays an important role by influencing consumers to stray from the purchasing of corporate products in favor of lesser-known, “underground” labels.

1.12 Better Beer Means Larger Profits

Even though the segment of the market that microbreweries serve is small relative to the entire brewing industry, the prices that consumers are willing to pay for such beers is far greater than those of the corporate producers, making this segment the most profitable in the industry (Schnell and Reese 2003). Based on 2001 figures, the average case (24-12 ounce bottles) of microbrewed (craft) beer was \$25.49, compared to only \$15.62 for the average case of domestic, mass-produced beer, indicating a gap of nearly ten dollars per case of beer sold (Tremblay and Tremblay 2005). This economic reality has created headaches for producers such as Coors, Miller, and Anheuser Busch as they attempt to capture this lucrative market segment (Carroll and Swaminathan 1998; Schnell and Reese 2003). Despite trying to produce craft-style beers that rival the smaller firms, the mega-brewers have not been able to win the new style of more sophisticated beer drinkers over mostly because of their corporate affiliation as denoted on their label, and not because of their inability to produce beers of equal quality (Carroll and Swaminathan 2003). World-renowned beer connoisseur Michael Jackson’s (1996) positive opinion of a

beer such as Anheuser-Busch's Muenchener-Style Amber provides evidence of the successful creation of craft beer by the highest volume producer of beer in the world, yet sales of the ale still suffer because of its affiliation with the large corporation (Carroll and Swaminathan 2003).

1.13 The Appeal of Place and the Local

The products offered by such large corporations lack the intrinsic appeal of the sophisticated consumer's wants because they are not being produced in an authentic small-scale, craft brewery setting. (Hannan, Carroll, and Polos 2003). Restaurant consultant Andrew Freeman interprets the shift in consumer preferences and attitudes as a result of people becoming interested in local production again, stating that, "They (consumers) want to know where their beer is coming from. They want it hand-crafted" (DiNardo 2008). The quest for authenticity on part of the savvy beer connoisseur is heavily geographic in nature, where craft beers typically have smaller outward extents to their production centers than is the case with the larger producers. Smaller batch production and the unique geographies of craft beer producers are able to successfully slay the Goliath's of their industry by focusing on a specific segment of the market that the larger producers are not able to satisfy.

Several demographic trends are evident in craft beer consumption in America. A 2002 study examining consumer tastes across age groups and regions, found that a plethora of information is needed to understand the specific niche of the beer market to which craft beer producers are finding their mark (*Beer Industry Update* 2002). The study compared the percentage of consumers who purchased several different types of

beer in the last year, including Budweiser, Coors Light, Michelob Light, Corona, Guinness, Samuel Adams, and Sierra Nevada. According to the Brewers Association definitions, the final two on the list are craft beers. The first point of importance from the study is that the consumers of the two craft beers in the survey are overwhelmingly white. 92.4% of beer consumers who purchased Samuel Adams were white, while only 1.3% of African Americans purchased this Boston-based beer throughout the study year. Similarly, 86.2% of consumers who purchased Sierra Nevada were Caucasian, compared to only 5.2% of African Americans. In terms of their respective percentages of the United States population, whites (Caucasians) are overrepresented in their craft beer purchases, while African Americans (and other non-white minorities not included in the study) are underrepresented in craft beer consumption.

Another important trend of the study relates to the age of consumers. For both Samuel Adams and Sierra Nevada, the age group with the highest percentage of selected craft beer purchases was 25-34. This group purchased Sierra Nevada at a rate of over ten percent greater than any other age group of legal alcohol consumers. Also of importance in craft beer purchasing decisions is income. A very clear pattern is evident that the buying of craft beer is heavily concentrated among higher income Americans. The highest income category in the study, \$75,000 or greater, purchased both Samuel Adams and Sierra Nevada with much greater frequency than all subsequent income brackets. This income grouping accounted for 55.5% of Samuel Adams purchases and 57.1% of Sierra Nevada, compared to a mere 13.9% and 10.5% for the respective beers in the next highest income grouping of \$60,000-\$75,000. Further down the income ladder, the percentage of craft beer purchased continued to decline sharply.

1.14 Fad or Fact: Are craft breweries here to stay?

Flack (1997) questioned the continued success of the small market brewing industry, citing the widespread success of their existence leading to homogenous facility construction and taking away from the uniquely local appeal. In conjunction with this, Florida (2002) argued that rather than being nonconformist and members of a counter-culture, “the creative class” has taken these seemingly unique cultural characteristics and transformed them into the mainstream. Marcial (1998) noted the decline of the market value of craft breweries following the decisions of several breweries to take their brewing operations public in 1995. The value of such formerly privately-held breweries went down to an average of one-third of their previous value. This period of stagnated growth in the latter half of the 1990s seemed to be caused by market saturation. Since the difficulties experienced by microbreweries in the 1990s, they have continued to succeed into the present, but at a much slower rate of expansion (Schnell and Reese 2003). More recent data pertaining to American craft brewing show that although the expansion of the craft brewing industry has slowed considerably in terms of the number of additional brewery openings, the annual sales and revenue generated have increased at a much greater rate than has that of the United States economy.

Many breweries were chastened by their experience with geographic expansion in the 1990s and have decided to retrench and serve only local or regional markets at best. After attempting to expand and sell their products in distant markets, some craft beer producers have realized that there is no place like home. As of 2000, New York’s Brooklyn Brewery still sold 80% of its product within the New York metropolitan area, and Shipyard Brewery of Kennebunk, Maine, after expanding distribution to include the

entire East Coast, was influenced by slumping sales to return to its home market, where 75% of its beer is now sold (Flaherty 2000). Furthermore, the continued enthusiasm of craft beer drinkers was evidenced at the Great American Beer Festival in Denver, Colorado (October 11-13, 2007), where tickets were sold out before the festival began for the first time in its 26-year history (Brewers Association 2007).

1.15 Background Data Analysis

Figure 1.2 reveals the increasingly important role played by craft breweries, indicating the increasing popularity of this type of beer. Beginning with base year 1997, the graph illustrates the strong performance of craft breweries in the United States. With the exception of 1998, every other year in this ten-year period has experienced positive growth, with the last three years seeing significant growth of 8, 9, and 12 percent respectively, reaching double-digit growth for the first time in the most recent year for which data are available. Furthermore, this rate of growth is in excess of the average growth in household income in America (1.1% from 2004-2005) (United States Census Bureau 2006), indicating that an increasing percentage of disposable income that is being spent on craft-brewed beers.

Brewpubs, the smallest form of brewery, account for greater than seventy percent of all craft breweries in the United States (Figure 1.3). Characterized by on-site beer sales rather than bottling and shipping their product to distant markets, this form of craft brewery is inherently local. Despite the majority of firms catering to local populations, the near-doubling of regional breweries in the decade spanned by this graphic is also of great importance. Regional breweries are the largest type of craft brewing in terms of

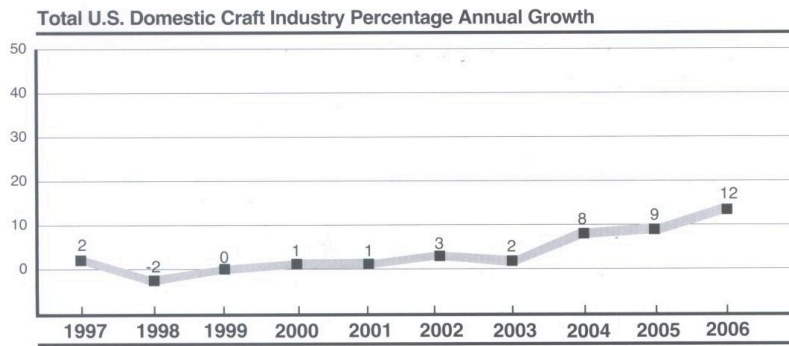


Figure 1.2: Annual Growth of Craft Brewing Industry (1997-2006)

Source: The New Brewer. 2007. Brewers Association.

annual volume produced, and are the most likely to distribute their product outside of their home regions.

Beginning with the year 1997, a sharp increase in the revenue of craft-brewing operations occurred (Figure 1.4). Despite brewpubs composing the largest number of craft breweries by type, they accounted for only about 13% of revenue generated in 2006, despite an increase of \$22 million from 2005. As a whole, the industry has experienced tremendous growth in recent years, “seeing double” for the first time last year with a growth rate of 12%. The percentage of growth far exceeds the annual growth in income, indicating a change in the decisions of consumers on what type of beer to purchase.

Figure 1.5 reveals a recent trend related to production amounts when compared to the total revenue generated in craft brewing (Figure 1.4). From 2005 to 2006, the growth in total annual barrels was marginal with an increase of 50 (thousand barrels), or 1.005% growth. The marginal production increase by craft producers does not equate to the

revenue increase in the same two-year period. 2006 saw a huge production increase of over 14% from 2005.

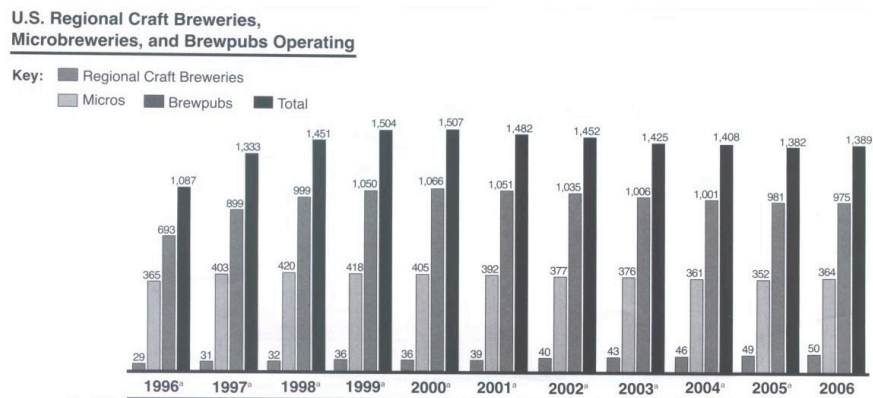


Figure 1.3: Distribution of Craft Breweries by Type

Source: The New Brewer. 2007. Brewers Association.

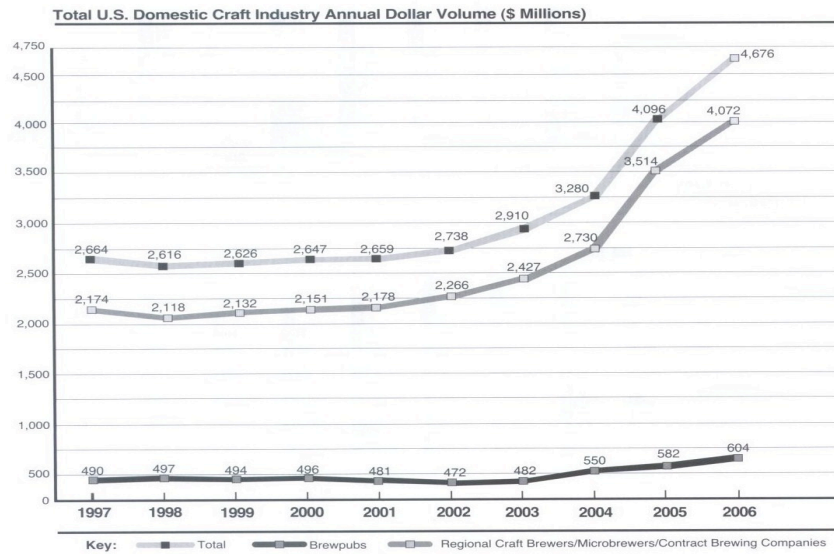


Figure 1.4: Revenue Generated by Type of Craft Brewer

Source: The New Brewer. 2007. Brewers Association.

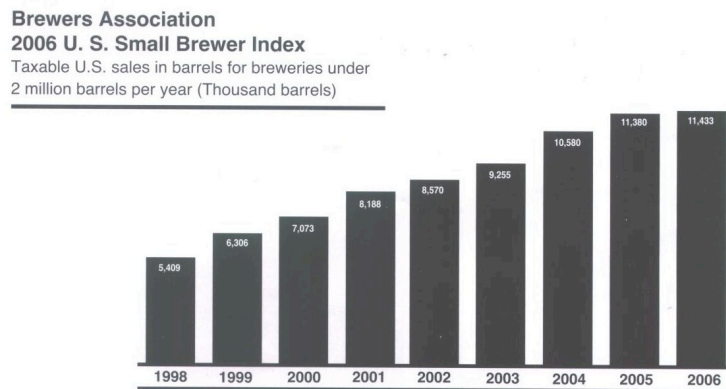


Figure 1.5: Annual Craft Brewing Production

Source: The New Brewer. 2007. Brewers Association.

CHAPTER 2

2.1 Methods and Data

In an effort to understand the brewing situation in a more specific context, the total number of craft breweries in each state were divided by each 100,000 residents of the respective state, producing a ratio of breweries per 100,000 residents. This will provide the basis for further analysis of factors conducive to craft brewery development by revealing where relative brewery concentration is the greatest and where it is the least.

Following the initial national calculation of breweries per 100,000 people for each state, the analysis will shift to a larger geographic scale by looking at individual states. Nine states will be subjected to further analysis—the three states with the highest ratio of breweries per 100,000 residents, three states in a middle range, and the three with the lowest ratio of breweries per 100,000 residents. The benefit of using leading cases, typical cases, and lagging cases will be important in my attempt to understand why the craft brewing trend has taken off in some states but not in others, and will provide insight into factors that lead to successful microbrewery operation at the state level.

Equation One: State Level Regression Model

Breweries per 100,000 residents = percentage of residents with bachelor's degree or higher + percent of population 25-34 + median household income + dependence on tourism + state expenditures per capita + percentage of craft breweries in non-metropolitan areas

The dependent variable of 'breweries per 100,000 residents' for each of the states will then be used in a regression equation, comparing brewery provision to several factor

conditions. Median household income, percentage of residents in the 25-34 age cohort, percentage of residents with a B.A. or higher, per capita state expenditures, dependence on tourism, and the percentage of non-metropolitan breweries will be among the variables considered for this analysis. The rationale for including the variables of median income and percentage of residents of ages 25-34 stems from the results of the 2002 *Beer Industry Update* study. This examination revealed important demographic information about purchasers of craft-brewed beer. Consistent with the results of this study, it is first hypothesized that there will be a positive relationship between the dependent variable of 'breweries per 100,000 residents' and median household income, where the overwhelming majority of craft beer was purchased by persons in higher income brackets. As evidenced by the price differential of nearly ten dollars per case of craft beers versus mass-produced products, the higher average cost of craft beers requires a greater amount of disposable income. Because of the relationship between the purchase of the selected craft beers in the study and younger people, the relationship between the dependent variable and 'percentage of residents 25-34' is hypothesized to be positive, implying that craft breweries will be more successful in states with a greater proportion of residents within this key age range.

To consider the effects of variations among states in terms of the degree of education, the percentage of the population with at least a bachelor's degree will be collected from the United States Bureau of the Census. Based on Bourdieu's notion that a person's educational upbringing is directly related to their patterns of consumption as a means of social distinction, it is anticipated that there will be a direct relationship

between the percentage of residents in each state that have obtained at least a bachelor's degree and the dependent variable.

Flack (1997) suggested the role that tourism plays a role in fostering for the state-level craft brewing success in Vermont, a state that he cited to be among the top tier of craft-brewing states. For this reason, the percentage of a state's budget that is used to promote tourism will be used as an independent variable. Consistent with his assertion, it is hypothesized that there will be a direct relationship between the percentage of state-level tourism investment and the independent variable.

The final independent variable to be included in the equation is the percentage of craft breweries in each state that are located outside of a metropolitan area. I hypothesize that a direct relationship exists between the ratio of breweries per 100,000 residents and larger percentages of breweries outside of large urbanized areas. Trends in popular culture such as the craft brewing phenomenon typically follow a pattern of hierarchical diffusion, as evidenced by the overwhelming percentage of craft breweries in America being located within metropolitan areas. Therefore, higher instances of non-metropolitan craft breweries should signify greater success in the diffusion of craft brewing at the state level down the urban hierarchy.

Additionally, because variations in state-level alcohol laws play a role in the extent to which craft brewing is able to develop, the state brewing laws for each of the nine states will be examined, but not as independent variables per se. Preliminary analysis indicates that the role of state brewing regulations can be significant. Mississippi's two claims of prominence in craft brewing, for example, are that 1) it

became the fiftieth state to legalize brewpubs (Tremblay and Tremblay 2006); and 2) it is the state with the lowest ratio of breweries per 100,000 residents.

Equation Two: MSA Level

Number of Craft Breweries per 100,000 residents = median household income + percentage of residents with at least a bachelor's degree + percentage of residents 25-34 + climate + transportation + economy and jobs + crime + arts and culture + quality of life + health and healthcare + leisure + education + cost of living + wage inequality rank + technology rank + talent rank + tolerance rank + creativity rank

Following the state-level analysis, this study will then narrow its focus to look at metropolitan areas within the United States. Each of the 331 metropolitan areas in the United States will be examined in an effort to understand exactly what forces are at work in driving the success of craft breweries. While it is hoped that the previous evaluation of entire states will reveal an understanding of why specific states are better suited to support craft breweries than others, narrowing the scope and focusing on more geographically fine-grained areal units might provide more revealing relationships between the ratio of breweries to population, demographic and sociological characteristics of an area. Extreme intrastate variations in terms of cultural characteristics have the potential to blur distinct, meaningful relationships, and shifting to the metropolitan level of analysis will attempt to evaluate the craft brewing environments of more sociologically homogenous segments of the population. Furthermore, the majority of American citizens reside in urban areas, indicating the great importance of understanding the phenomenon at the metropolitan scale. This portion of the analysis will utilize the scores of urban areas based on their index ratings from Frommer's (2004) *Cities Ranked and Rated*, and Florida's (2002) *The Rise of the Creative Class*, as well as

data from *The United States Bureau of the Census*. The respective ratings of each metropolitan area will be compared to its level of craft brewing success. I hypothesize that the more favorably a metropolitan area is perceived based on its respective scores, values, and rankings, the more successful its craft brewing industry will be, indicating that brewery provision can be used as a measure of “coolness” or having “arrived”.

A multivariate linear regression equation was employed to evaluate how closely related the cultural attributes of a metropolitan area is to its respective craft brewing industry. First, a simple Ordinary Least Squares (OLS) regression will be used that employs all variables from all sources. Following the inclusion of all 18 variables, three separate models will then be constructed using variables obtained from the three disparate data sources. Finally, the stepwise regression procedure will be employed in an effort to determine which of the variables have the greatest amount of predictive power based on the percentage of statistically explained variance within the dependent variable that they are able to account for. Because of the similar nature of some of the cultural variables, this stepwise procedure should eliminate those variables whose values highly collinear with others variables in their relationship to the independent variable. A valid regression equation should not contain a large amount of collinearity among the independent variables and the partialing procedures use in the stepwise regression programs assures that such collinearity is reduced. This will ensure that a clearer relationship will be determined.

The equation will be predictive in nature; it is hoped that by using this multitude of information pertaining to each metropolitan area, the model will be able to accurately forecast how suited a given MSA is to craft brewing success as measured by the number

of craft breweries per 100,000 residents. Undoubtedly the number of craft breweries operating within an MSA will, at least in part, be related to the overall population of the MSA. An MSA with a central city population of, say, 500,000 would be more likely to have several craft breweries than would an MSA with a central city population of only 50,000). By transforming the total number of breweries to a per capita basis, the effects and influences of the demographic and sociological variables should come to the forefront.

A number of variables will be used from *Cities Ranked and Rated* (2004), including scores of an MSA's 'economy and jobs', 'arts and culture', 'quality of life', 'climate', 'education', 'leisure', 'transportation', 'health and healthcare', 'crime', and 'cost of living'. All of the preceding variables from *Cities Ranked and Rated* are represented as scores (i.e. ratio data), where zero is the lowest possible value and 100 is the highest. Richard Florida's (2002) rankings of metropolitan areas based on their respective degrees of 'wage inequality', 'technology provision', 'tolerance', 'talent', and 'creativity' will also be evaluated in the regression equation (Appendix Two). Finally, variables of 'median household income', 'percentage of residents with a bachelor's degree or higher', and 'percentage of residents in 25-34 age cohort' will be derived from the United States Census Bureau's 2000 population census.

Among the variables to be included in the metropolitan regression models, there are several hypothesized inverse relationships between the dependent variable and the independent variables. Among these are 'cost of living', 'technology rank', 'creativity rank', 'talent rank', and 'tolerance rank', where it is anticipated that the values and ranks

of these indices will be inversely related to the dependent variable, ‘craft breweries per 100,000 residents’.

Only one of the eighteen variables to be evaluated through regression modeling, ‘wage inequality rank’, has no hypothesized relationship. This variable, a ranking of metropolitan areas based on the degree of the wage gap present in respective metropolitan areas, assesses the degree of inequity present in MSAs. No existing literature on craft brewing addresses this issue, so its inclusion in the respective models is simply to determine if such a relationship exists in either direction. This ranked-order variable, taken from *The Rise of the Creative Class* (2002), assigns rankings closer to one to those metropolitan areas with a lesser degree of a wage gap, and higher scores indicate a greater presence of economic inequality at the intrametropolitan level. If a positive relationship is elicited, therefore, it could be assumed that craft brewing is more prominent in areas with a greater wage gap, while a negative relationship would imply that craft brewing tends to be more popular in more egalitarian areas.

For all of the other variables, it is hypothesized that there will be a direct relationship between the dependent variable and the remaining independent variables. Higher values for the remaining indices and ‘median household income’ should influence increased numbers of breweries in an MSA. (For a summary of the anticipated relationships between the dependent variables and the independent variable of ‘breweries per 100,000 residents, please see Table 2.1).

Table 2.1: List of Variables and Hypothesized Relationships

Variable	Expected Relationship	Variable (cont'd)	Expected Relationship
1).Economy and Jobs	Positive	10). Crime	Positive
2).Arts and Culture	Positive	11). Technology Rank	Negative
3). Quality of Life	Positive	12). Wage Inequality Rank	???
4). Climate	Positive	13). Tolerance Rank	Negative
5). Education	Positive	14). Talent Rank	Negative
6). Leisure	Positive	15). Creativity Rank	Negative
7). Transportation	Positive	16). Pct. with B.A. or greater	Positive
8).Health and Healthcare	Positive	17). Pct. ages 25-34	Positive
9). Cost of Living	Negative	18). Median Household Income	Positive

To analyze the role of the several independent variables included in the equation, the residuals from the regression equation will be examined more closely. A careful evaluation of the metropolitan areas that are the farthest from the regression line in either direction from their predicted values will be conducted to uncover possible reasons of why they don't fit the overall model. For example, a city in a state such as Mississippi may possess appealing urban characteristics, but might still be overpredicted in the craft brewery model because of the legacy of preventative state laws and regulations. Conversely, a metropolitan area in the Pacific Northwest might be underpredicted because of an unmeasured characteristic such as the region's stereotypical affinity with all things local. Additionally, the three MSAs that are the closest to the regression line (i.e., that are the most accurately predicted) will be analyzed, as well.

2.2 A Qualitative Look at American Craft Brewing

The first portion of the qualitative analysis to be conducted will be an evaluation of cultural factors related to success in the brewing industry. Flack (1997) cited reasons

such as tourism in Vermont and the Pacific Northwest as a form of “Ecotopia” for the youth culture as being key factors for craft brewery presence in such areas. Consistent with Schnell and Reese’s (2003) analysis, these phenomena will be examined through the marketing strategies of firms in their naming of products. For example, breweries in Montana have employed a fly-fishing motif in their label designs and names, a key source of tourism to the state. Names of craft brews such as “Trout Slayer,” “Grizzly Wulff Wheat,” and “Wild Fly Ale” (references to both resident fish and aquatic insect imitations used in fly fishing) provide evidence of this marketing technique. This section of the analysis will be achieved by visiting websites of craft breweries and interpreting the marketing strategies of breweries through their naming of products. Schnell and Reese (2003) discovered regional variations in the approaches of craft producers in naming conventions—some areas focused on attributes of the natural environment, while other regions predominantly made references to historical events of the local area. By maintaining my focus on outliers of the stepwise regression model, it is hoped that this part of the evaluation will reveal additional information pertaining to the strategies of successful and lagging metropolitan regions.

CHAPTER 3

3.1 Analyzing Craft Brewing At the State Level

Before narrowing the scale of focus to individual states, an analysis of regional and subregional variations of craft brewing will be useful to understanding the variability in the distribution of craft breweries in different parts of the country. The United States Bureau of the Census divides the United States into four broad regions: Northeast, South, West, and Midwest (Figure 3.1). Extreme variations are present when craft breweries are evaluated from this regional perspective. For instance, the 17 states that comprise the Census-defined South, despite possessing the largest percentage of the national population of any region, has the lowest number of craft breweries. The lagging status of the South is apparent in Table 3.1 pertaining to craft brewing at the regional level. This region's poor performance in craft brewery provision is evidenced in the three data categories: breweries, breweries per state, and average breweries per 100,000 residents, with the South coming in last place in all three categories.

Table 3.1: An Analysis of Craft Brewing at the Regional Level

Region	Number of States	Population	Breweries	Breweries per State	Average Breweries per 100,000 residents
North Central	12	64,392,776	329	27.4	0.54
Northeast	9	47,594,378	266	29.4	1.04
South	17	100,236,820	241	14.2	0.30
West	13	65,005,889	640	49.2	1.39

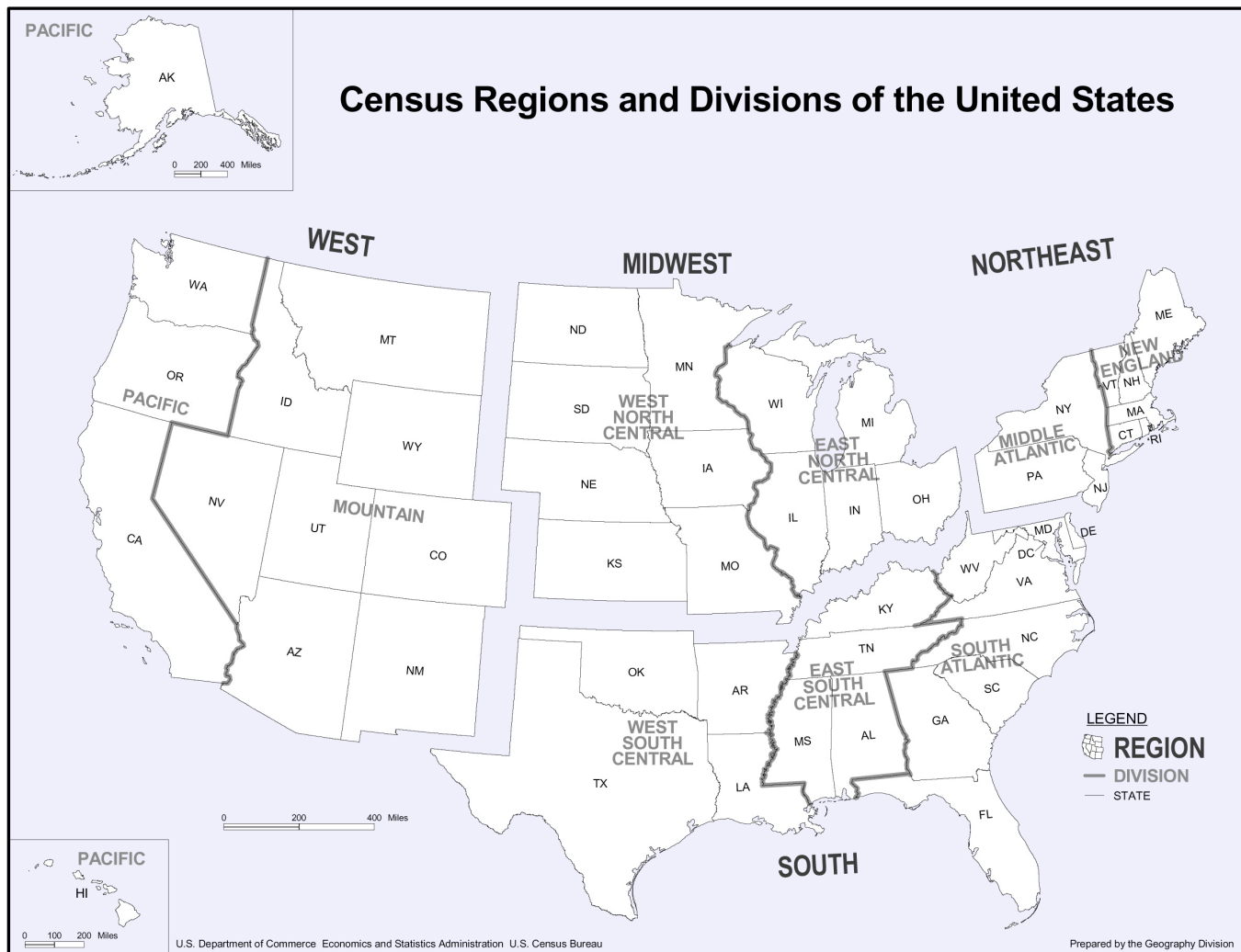


Figure 3.1: Composition of Census Regions and Divisions

Source: www.census.gov

The West, on the other hand, is, by far, the most developed region in its craft brewing. This 13-state region has nearly twice as many craft breweries as any other region, and its scores in the categories of ‘breweries per state’ and ‘average breweries per 100,000 residents’ are far greater than any of the other three regions. The Midwest is the second lowest region in terms of the ‘breweries per 100,000 residents’ ratio despite having the second highest number of craft breweries within the region. Finally, the Northeast is the only region other than the West to exceed the ratio of one brewery per 100,000 residents.

In addition to dividing the nation into four regions, the United States Bureau of the Census’ geography also further divides the fifty states into nine subregions called divisions within their larger respective regional designations. The information presented in the regional breakdown of craft brewing can therefore be taken a step further to understand the variations of craft brewing at a larger, more fine-grained, geographic scale. For instance, the lagging status of the southern region as a whole can be better understood when broken into its three subregional component parts. The subregional scale shows that while the subregions of East South Central and West South Central divisions are the two lowest in the nation in terms of the ratio of breweries per 100,000 residents, the states that comprise the South Atlantic division have a ratio of breweries per 100,000 residents that exceeds that of another subregion outside of the larger South. The subregions that make up the West region are, on the other hand, clearly two of the most well-developed in the nation both in terms of the total number of craft breweries in operation as well as the ratio of craft breweries per 100,000 residents. The five Pacific states account for greater than one-quarter of all craft breweries in the United States, and

this subregion also has the largest ratio of breweries per capita of any in the country. Regardless of whether John McAuliffe or Fritz Maytag was responsible for the dawning of craft brewing in America, the geographic locations of both of those first-wave brewing operations was within the Pacific Census division, suggesting the extent to which the culture hearth of craft brewing continues to be more successful than other areas of the country.

An examination of regional and subregional variability in the extent of craft brewing success helps to provide further understanding of craft brewing in America as the scale narrows to evaluate individual states. The geographic dispersal of craft breweries at the state level reveals huge variations in the numbers of craft breweries operating within respective states. California has 230 craft breweries within its borders compared to a single brewery in both Mississippi and North Dakota. The role of population is obviously important; the most populous state in the Union possesses the most craft brewing facilities. When the effects of population are, however, eliminated by using the standardized measure of ‘breweries per 100,000 residents’, it is clear that population is not the sole driving force in determining the market for locally-produced beers.

There are numerous examples of craft breweries in America that are operating at a scale that clearly exceeds the demand of the immediate population. Two prime examples of this scale phenomenon are the Boston Beer Company (Samuel Adams) and the Sierra Nevada Brewing Company, both of which distribute their products nationwide. Evaluating the number of craft breweries regardless of size is, however, still important.

Table 3.2: Variations in Craft Brewing at the Sub-Regional Level

Subregion (i.e. Division)	Region	Breweries	Breweries per State	Number of States	Population	Average breweries per 100,000 residents
East North Central	Midwest	227	45.4	5	45,155,037	0.57
West North Central	Midwest	102	14.6	7	19,237,739	0.52
Middle Atlantic	Northeast	137	45.7	3	33,671,861	0.39
New England	Northeast	129	21.5	6	13,922,517	1.37
South Atlantic	South	169	18.8	9	51,769,160	0.44
East South Central	South	26	6.5	4	17,022,810	0.14
West South Central	South	46	11.5	4	32,444,850	0.16
Mountain	West	221	27.6	8	18,172,295	1.37
Pacific	West	415	83	5	45,025,250	1.43

Even the largest of craft producers in America started small, and had to be well-accepted at the local level before expanding to include distant regions in their distribution systems. The first wave of commercial craft brewers came onto the scene only after being successful in private settings as home brewers.

Extreme variations in the total number of craft breweries operating in each state are quite apparent (Table 3.3). California's place on top of the rankings does not come as a surprise, given that the state accounts for more than ten percent of the nation's total population. Dispersed within the listing, however, are numerous examples of states whose total number of breweries does not closely reflect the total population of the respective state. For example, the least-populated state in the country, Wyoming, ranks higher than thirteen other states in terms of the number of its craft breweries. Such seeming "anomalies" provides further evidence that factors other than raw population are influencing the extent to which craft brewing is able to develop in a particular state.

Table 3.4 paints a very different picture of craft brewery provision at the state level when the number of craft breweries is adjusted to the population of a state. Returning to the state with the largest population, California, its ranking, when adjusted to population, differs greatly from when the number of craft breweries alone (independent of state population) is considered (Table 3.3). California drops to the eighteenth position when the population of the state is factored into the equation (i.e. the 'breweries per 100,000 residents' ratio). On the other end of the population spectrum, the least populated state, Wyoming, jumps from 37th place in the ranked ordering of the number of craft brewing facilities to seventh place when the effect of population alone is

Table 3.3: Ranked Listing of States by Number of Craft Breweries

State	Number of Craft Breweries	State	Number of Craft Breweries
California	230	Vermont	17
Colorado	90	Idaho	16
Washington	86	Iowa	16
Oregon	78	Kansas	16
Michigan	77	Nebraska	15
Pennsylvania	62	Nevada	15
Wisconsin	62	South Carolina	15
New York	55	New Hampshire	14
Massachusetts	42	Tennessee	14
Florida	40	Utah	14
Illinois	34	Alaska	13
Maine	34	Wyoming	10
Arizona	33	Hawaii	8
Ohio	31	Delaware	7
Texas	29	Oklahoma	7
Missouri	28	Alabama	6
Virginia	28	Louisiana	6
Maryland	25	West Virginia	6
North Carolina	25	Kentucky	5
Indiana	23	Rhode Island	5
Minnesota	22	Arkansas	4
Montana	22	District of Columbia	4
New Mexico	21	South Dakota	4
New Jersey	20	Mississippi	1
Georgia	19	North Dakota	1
Connecticut	17		

Table 3.4: Ranked Breweries per 100,000 Residents by State

State:	Number of Craft Breweries	State:	Number of Craft Breweries
1. Vermont	2.79	27. Missouri	0.50
2. Maine	2.67	28. Connecticut	0.50
3. Montana	2.44	29. Rhode Island	0.48
4. Oregon	2.28	30. Maryland	0.47
5. Colorado	2.09	31. Minnesota	0.45
6. Alaska	2.07	32. New York	0.42
7. Wyoming	2.03	33. Virginia	0.40
8. Washington	1.46	34. Indiana	0.38
9. Idaho	1.24	35. South Carolina	0.37
10. Wisconsin	1.16	36. West Virginia	0.33
11. New Mexico	1.15	37. North Carolina	0.31
12. New Hampshire	1.13	38. Illinois	0.27
13. Delaware	0.89	39. Ohio	0.27
14. Nebraska	0.88	40. Florida	0.25
15. Michigan	0.77	41. Tennessee	0.25
16. Nevada	0.75	42. New Jersey	0.24
17. DC	0.70	43. Georgia	0.23
18. California	0.68	44. Oklahoma	0.20
19. Massachusetts	0.66	45. North Dakota	0.16
20. Hawaii	0.66	46. Arkansas	0.15
21. Arizona	0.64	47. Texas	0.14
22. Utah	0.63	48. Alabama	0.13
23. Kansas	0.60	49. Louisiana	0.13
24. Iowa	0.55	50. Kentucky	0.12
25. South Dakota	0.53	51. Mississippi	0.04
26. Pennsylvania	0.50		

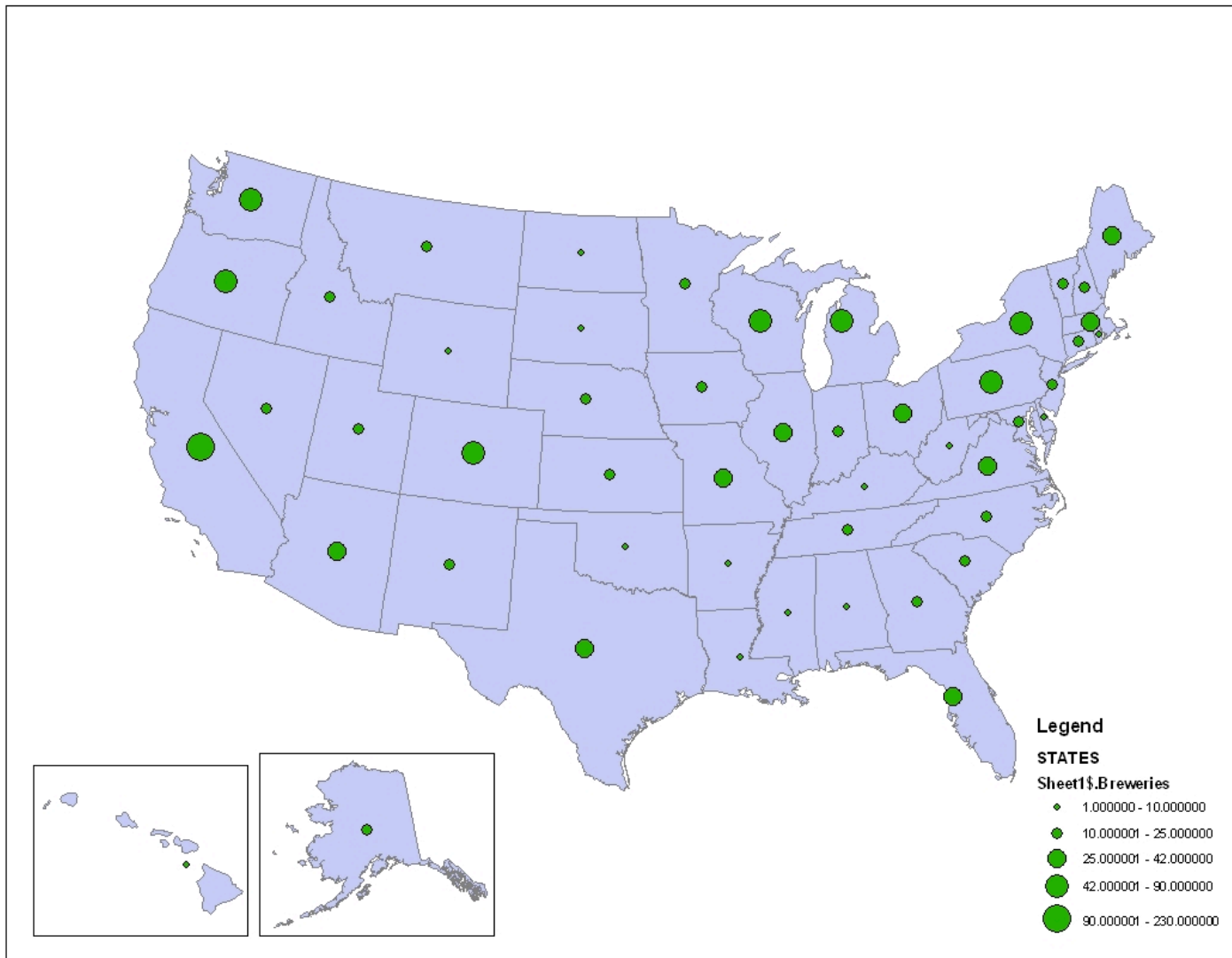


Figure 3.2: Distribution of Craft Breweries by State

considered. Its ten breweries produce a ratio of slightly greater than two breweries per 100,000 residents in the state.

The variations in the extent of craft brewing at the state level is extreme. Vermont is the leading state in this ratio with 2.79 breweries per 100,000 residents, compared to Mississippi's 0.04. The lack of a clear relationship between a state's population and the number of craft breweries within its borders presents an interesting challenge to researchers. If not population per se, then what factors account for the spatial distribution of craft breweries? Several cultural variables and their influences on the provision of craft brewed beer at the state scale will be examined. The marketing techniques of brewers will, furthermore, be examined as potentially important means of understanding the role that geographic and cultural traits have on influencing success in craft brewing. Finally, where applicable, an evaluation of prohibitive alcohol-related regulations will be examined as potential influential factors preventing craft breweries from being established in various locales.

At the national level, a large majority of craft breweries are located within metropolitan areas. Just as there are large variations in the ratios of craft breweries per 100,000 residents among states, there is also a wide variation in the number of breweries located in metropolitan areas versus non-metropolitan areas among the states (Table 3.5). If the diffusion of craft brewing followed hierarchical principles, it would make sense that craft breweries would first appear in large population centers (i.e. metropolitan areas). Larger population clusters provide larger potential markets and, therefore, one would suppose that the chance of establishing a successful brewery would be far greater in a more populous area. The data support this assertion that the earliest brewery

Table 3.5: Distribution of Craft Breweries by State Ranked by Non-Metropolitan Percentage

State	% Craft Breweries in Non-Metropolitan Areas	State	% Craft Breweries in Non-Metropolitan Areas
1. Mississippi	100.0	27. Texas	20.7
2. Vermont	76.5	28. Nevada	20.0
3. Alaska	69.3	29. Massachusetts	16.7
4. Idaho	68.7	30. Ohio	16.0
5. Montana	68.2	31. Pennsylvania	14.5
6. West Virginia	66.7	32. Oklahoma	14.3
7. New Hampshire	64.3	33. Virginia	10.7
8. Hawaii	62.5	34. Indiana	8.7
9. Maine	53.0	35. California	8.3
10. Utah	50.0	36. Maryland	8.0
11. Wyoming	50.0	37. North Carolina	8.0
12. Nebraska	46.7	38. South Carolina	6.7
13. Iowa	44.0	39. Georgia	5.3
14. Wisconsin	41.9	40. Illinois	3.0
15. Colorado	38.9	41. Florida	2.5
16. Kansas	37.5	42. Alabama	0.0
17. Oregon	34.6	43. Arkansas	0.0
18. New Mexico	33.3	44. Connecticut	0.0
19. Missouri	32.1	45. Washington, D.C.	0.0
20. New York	29.1	46. Kentucky	0.0
21. Delaware	28.6	47. Louisiana	0.0
22. Michigan	27.3	48. New Jersey	0.0
23. Washington	26.7	49. North Dakota	0.0
24. South Dakota	25.0	50. Rhode Island	0.0
25. Minnesota	22.8	51. Tennessee	0.0
26. Arizona	21.0		

founding dates in respective states are overwhelmingly located in metropolitan areas. The variability in the rates of subsequent craft brewery developments into non-metropolitan areas in states may, therefore, serve as an indicator of the overall state-level saturation of craft brewing, where the more successful states have larger percentages of breweries operating in non-metropolitan areas. Furthermore, a Spearman's Rank correlation coefficient of .572 between the ranked listings of 'breweries per 100,000 residents' and 'percentage non-metropolitan breweries' give validity to the argument that, as a general rule, states that are more developed in their craft brewing overall also tend to have a larger percentage of breweries in non-metropolitan areas, indicating that the diffusion of breweries has trickled down the urban hierarchy to now include smaller non-metropolitan places.

I will now narrow the focus of the study to specific states in order to determine why these varying degrees of craft brewing occur at the state level. Nine states will be analyzed: the three with the highest ratio of breweries to population (1 (Vermont), 2 (Maine), and 3 (Montana)), the middle three (25 (South Dakota), 26 (Pennsylvania), and 27 (Missouri)), and the lowest three (49 (Louisiana), 50 (Kentucky), and 51 (Mississippi)).

3.2 Vermont

Two of the three states in the top tier of craft breweries in operation per population are located in the New England region, with Vermont coming in first place. Seventeen breweries operate in Vermont, a state with a population of 608,827 (a ratio of

‘breweries per 100,000 residents’ of 2.79). To put this in perspective, Vermont’s rate of ‘breweries per 100,000’ residents is more than 79 times that of the “least crafty” state of Mississippi.

One factor that appears to make Vermont so successful in its local craft brewing industry is that breweries have emerged beyond the bounds of its only metropolitan area-- Burlington. Of the 17 breweries operating within the state, only four are situated within Burlington. The remaining 13 craft-brewing operations are located in smaller municipalities that do not qualify as being census-defined metropolitan areas. Vermont has the second-highest percentage of non-metropolitan breweries, lagging behind only Mississippi, whose sole brewery in the state is located outside of a metropolitan area, making Mississippi an anomalous example of the hypothesized hierarchical diffusion process.

Craft-brewed beer is a more costly alternative than its non-craft, mass-produced counterpart, meaning that consumers spend a larger percentage of disposable income to purchase the craft products. This would lead one to believe that a state that was able to foster the continued success of a large number of breweries per capita would be a state with a higher-than-average median household income. Surprisingly, this is not the case for Vermont. This state falls in the middle of all states in terms of median household income, with a dollar value of \$40,856. This implies that despite the state’s residents’ wages being only average by national standards, the consumers within it are willing to spend a larger percentage of their earnings to buy these alternatives to mass-produced goods. Despite the disproportionate percentage of consumers in the age grouping 25-34 that purchase craft brewed beers with the greatest frequency (Beer Industry Update 2002)

Distribution of Craft Breweries in Vermont

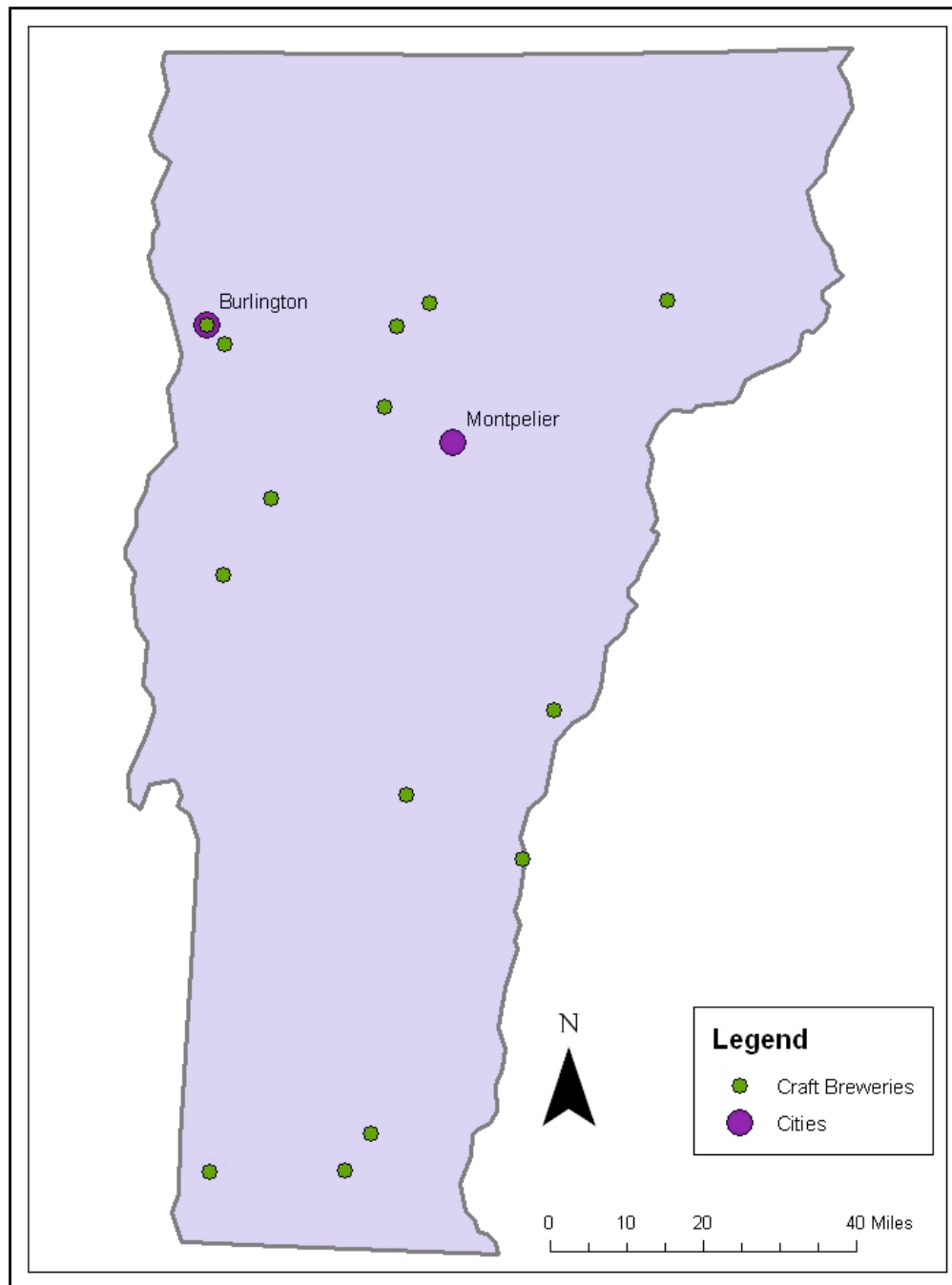


Figure 3.3 Distribution of Craft Breweries in Vermont

Vermont surprisingly does not have a large percentage of its population within this age range. With only 12.2% of its residents between the ages of 25 and 34, Vermont has one of the lowest percentages within this particular age range of any state, coming in 47th place. This is extremely surprising given that this segment of the population is ostensibly responsible for such a large percentage of craft brewed beer purchase and consumption.

In addition to intrastate consumption of craft-brewed beers, Vermont ranks in the top fifth (7th place) of states in terms of expenditures within the state to promote tourism⁴. Vermont has a locational advantage in promoting tourism as it is within a short distance of the United States' largest population cluster—the cities of the “megapolitan” region (Gottman 1962). Furthermore, Vermont ranks in the top tenth of states in the percentage of land covered by forests lending itself to ample recreational opportunities, another key factor in attracting tourists to the state.

Vermont's largest craft brewery, Magic Hat, clearly acknowledges the local geography of the region in its naming conventions. This Burlington-based brewery's Single Chair Ale is described as, “Celebrating the uniqueness of the Mad River Glen Cooperative Ski Area in Vermont.” (Figure 3.4) The brewery utilizes locally available ingredients as well, incorporating locally collected honey from Vermont's Champlain Valley. Additionally, the region's climate is a subject of focus in the names and description of several beers available from the brewery. Due to its latitude, Vermont's climate offers four distinct seasons, thus allowing the brewery to capitalize on selling the seasonal variability of the region. While several references are made to celebrate

⁴ This figure is taken from *Cities Ranked and Rated*, and is calculated by dividing the total amount of money spent on tourism within a state by the state's gross domestic product.

Vermont's local geography, the appeal is not confined to Burlington's immediate area. The Magic Hat brewery now distributes its beers up to three thousand miles away from their New England location (<http://www.magichat.net/>).

Another interesting technique employed by a Vermont craft brewery is Wollaver's brewery producing all of their beers with hops that are certified organic. This brewery merged with another popular Vermont brewery in 1997 when the Wollaver family bought out another brewery, The Otter Creek Brewing Company. Both of these beers are now distributed far beyond the state boundaries, perhaps because of their ability to now capitalize on economies of scale. The beers marketed with the Wollaver's label seem to be targeting a specific sub-niche within the larger niche market of craft- brewed beers. All of their beers are brewed with certified organic hops, and the language of their marketing only further reinforces their attempt to satisfy the beer desires of the ecologically, socially conscious consumer. The brewery website provides visitors with literature pertaining to energy, organics, waste, and the local economy (www.wollavers.com). The brewery states that their vision is, "Local, organic, collective,



Source: www.magichat.net

Figure 3.4: Image of Magic Hat's Single Chair Ale

green, and handcrafted,” which is further supplemented by the scene depicted on their logo (Figure 3.5). Farmers are shown as being one with the land, operating by hand on a small farm on the edge of a forest. Unlike other breweries within the state, Wollaver’s does not make specific references to local phenomena in their naming conventions, but instead takes an approach that appeals to eco-friendly consumers dispersed beyond the bounds of the local market. Based on the large distribution market of this label, the success of marketing to this “sub-niche” of the larger craft-brewed beer niche market is obvious.

3.3 Maine:

The other New England state falling in the top tier of craft brewing when adjusted for population is Maine. There are 34 breweries operating in this northeastern state with a population of 1,274,923. Its ratio of ‘breweries per 100,000 residents’ of 2.67 puts it in second place behind only Vermont. Maine ranks in the top fifth of states in terms of its



Figure 3.5: Images of Wolaver's Brewery Labels

Source: www.wolavers.com

percentage of craft breweries in non-metropolitan areas, indicating the large degree to which breweries have located away from large population centers (Figure 3.6). Despite the higher average costs of craft-beers, the median household income in Maine does not reflect its craft brewery provision. The state ranks 39th in median household income, far lower than would be expected based on the number of craft brewing establishments in the state. Its higher than average reliance on tourism could help to explain this discrepancy, where brewers are able to market their products to visitors to the state, thus relying on consumers from outside of the state to purchase the beers brewed within it.

Looking at the state as a whole, Maine has the third oldest average age resident in the nation. With a median age of 38.6, it is in excess of the range of consumers who purchase craft-brewed beers with the greatest frequency. Homing in on the age range of consumers who are the most likely to purchase craft beer products, like Vermont, Maine also has a very small share of consumers in the age range of 25-34, with a ranking of 46. As was the case for the other New England state with a large ratio of craft breweries to 100,000 residents (Vermont), this comes as a surprise for Maine as well. The results of the *Beer Industry Update* (2002) do not reflect the reality of this particular demographic characteristic, which would lead one to believe that a state with an excess of craft breweries would also have a large percentage of the population falling within the age group that is most likely to purchase craft beers.

The state of Maine also has a majority of its craft breweries in non-metropolitan locations (53%), providing further evidence of the relationship between the hierarchical diffusion process and the overall success of craft brewing at the state level. As the state's

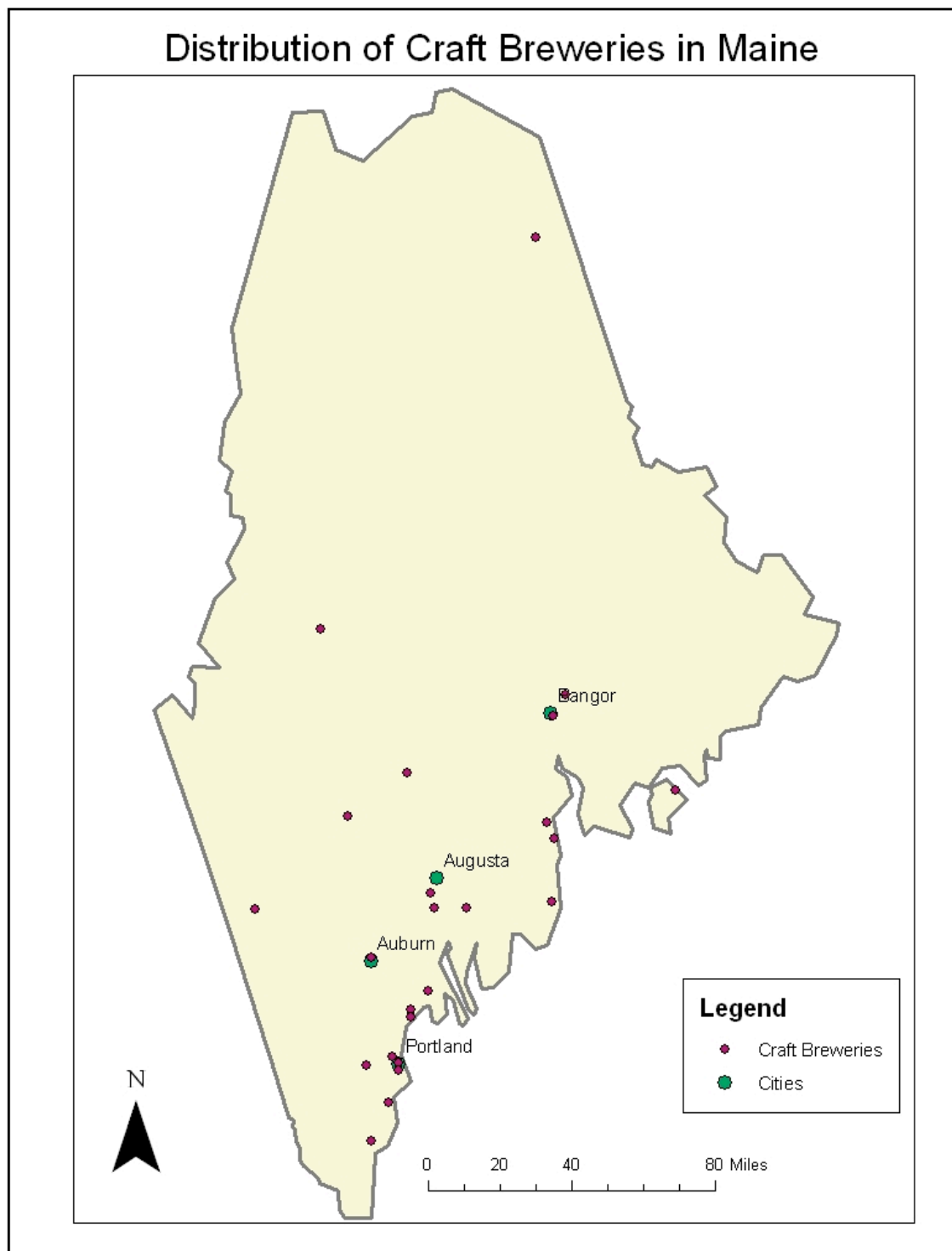


Figure 3.6: Distribution of Craft Breweries in Maine

nickname of “Vacation Land” implies, Maine’s non-metropolitan craft brewing success is, at least in part, influenced by the influx of tourists to this northeastern state. Consistent with this is the higher-than-average percentage of the state’s GDP being devoted to the promotion of tourism, Maine comes in 14th place based on the ranked percentages of states’ GDPs that are used for tourism promotion.

The naming conventions of many craft beers in Maine support the tourism assertion, with the names of beers highlighting icons and images that are a reflection of the state. Flack (1997) argued that the “neo-local” component of craft breweries was a celebration of the local culture, while Galbraith (2008), using Maine craft breweries as his area of study, refuted Flack’s argument. Rather than celebrating real aspects of the local culture, Galbraith claimed that the naming techniques used by local brewers are not a reflection of the actual local conditions, but instead represent images and stereotypes of the state that outside consumers assume to be true of Maine and its people. One such example of this is the Special Old Bitter Ale from the Atlantic Brewing Company in Bar Harbor reflecting the stereotypical image of the crotchety old lobster fisherman. (Figure 3.7) Concerns with iconography have not been limited to the naming of beers in Maine: the logo displayed on the state’s license plate was an object of recent intrastate contention. Some inlanders felt that the decision to use the lobster as the state’s logo was a reflection of only the coastal portion of the state’s population. “Inlanders” argued that the lobster was not a reflection of Maine beyond the coast. As a result of this, the standard display on the license plate now caters to the image of the interior of the state,

where an array of deciduous trees serves as a representation of the forestry industry and the immense wilderness found within the interior of the state.

The state's largest metropolitan area, Portland, has fifteen craft breweries currently in operating within the MSA, based on the most recent data available. The oldest of the craft breweries, Gritty McDuff's, is located in the heart of downtown. The brewery does not hesitate to equate itself with a quaint image, using the word "brewtique" on the sign in the background of the picture below (Figure 3.8). The brewery is direct in its marketing of beers to outsiders, using the state's nickname in one of its brews: Vacationland Summer Ale, catering to the summer tourist population. Present on the label are an array of positive summer images of Maine, from the coniferous forests and recreational rivers to moose and the lighthouses along the coast. Gritty McDuff's also makes a mocking reference to perhaps Maine's most infamous and annoying summer insect, the biting black fly, with the beer Black Fly Stout (www.grittys.com).



(source: www.atlanticbrewing.com)

Figure 3.7: Image of Atlantic Brewing Company's "Special Old Bitter Ale"

Regional history is of primary concern in the names and marketing of Maine's largest brewery, The Shipyard Brewing Company. As its name and logo imply, this brewery is a reference to the shipbuilding industry present in and around Portland. In addition to the industrial references, local historical figures also appear in beer titles for The Shipyard Brewing Company. Perhaps specifically in reference to his famed poem "Woods in Winter", Portland-born poet Henry Wadsworth Longfellow is honored in the naming of "Longfellow Winter Ale". Civil War hero Joshua Lawrence Chamberlain, a native of Maine, is the subject of the brewery's hoppiest beer, the Chamberlain Pale Ale (<http://www.shipyard.com/>).

Going along with the icon formerly depicted on the Maine license plate, Bar Harbor's Thunder Hole Ale and Bar Harbor Real Ale both make reference to the lobster



(photograph by James Baginski)

Figure 3.8: Image of Gritty McDuff's Brewpub in Downtown Portland

industry, displaying the crustacean on both bottle's labels (www.barharborbrewing.com). While the coastal breweries are selling their local geography, inland brewers present a drastically different image. The Kennebec River Brewing Company, located within The Forks Resort, a getaway catering to outdoor-oriented recreational activities, presents a very different image on its labels. This small brewery's logo displays raging white water, mountains, and coniferous trees, selling the rugged wilderness present in non-coastal Maine, as is depicted on the label of the brewery's Summer Ale (Figure 3.9). (http://www.northernoutdoors.com/site/resort/the_forks_resort_center/kennebec_river_brewery.html)



Source: www.northernoutdoors.com

Figure 3.9: Image of Kennebec River Brewing Company's "Summer Ale"

3.4 Montana

Of the top three craft brewing states, Montana is the only one that is not located within New England. Ranking third in its ratio of ‘breweries per 100,000 residents’, the large state of Montana is situated atop the Mountain West subregion of the United States Bureau of the Census’ divisions. This state’s very different site and situation from Vermont and Maine greatly affect how the beers from craft breweries are presented to consumers, and the target market is clearly distinct from that of the craft brewers in the two New England states analyzed previously.

As was the case for the other two leading states, Montana is similar in that it also has a majority of its craft breweries operating outside of metropolitan statistical areas. Fifteen of its 22 craft breweries are located outside of the Billings, Great Falls, and Missoula MSAs, thus indicating that the process of hierarchical diffusion has influenced the brewery foundings in less populated areas throughout the mountain state. Such non-metropolitan breweries tend to locate in high amenity areas, thus creating an extraneous market due to the influx of tourists to such locales. One such example of this phenomenon is Wolf Pack Brewery in West Yellowstone, a town of 912 permanent residents (West Yellowstone Traveler 2008: www.westyellowstonetraveler.com). Despite the small number of permanent residents, this brewery is able to capture the tourist market of those entering and exiting the west gate of Yellowstone National Park, as well as the visitors who come to town to pay homage to the “Mecca” of fly fishing⁵.

⁵ West Yellowstone, Montana was referred to as “Trout Town USA” due to its proximate location to a large number of famed trout fishing waters, as well as the presence of a large number of fly fishing shops located in the town (Gierach 1994).

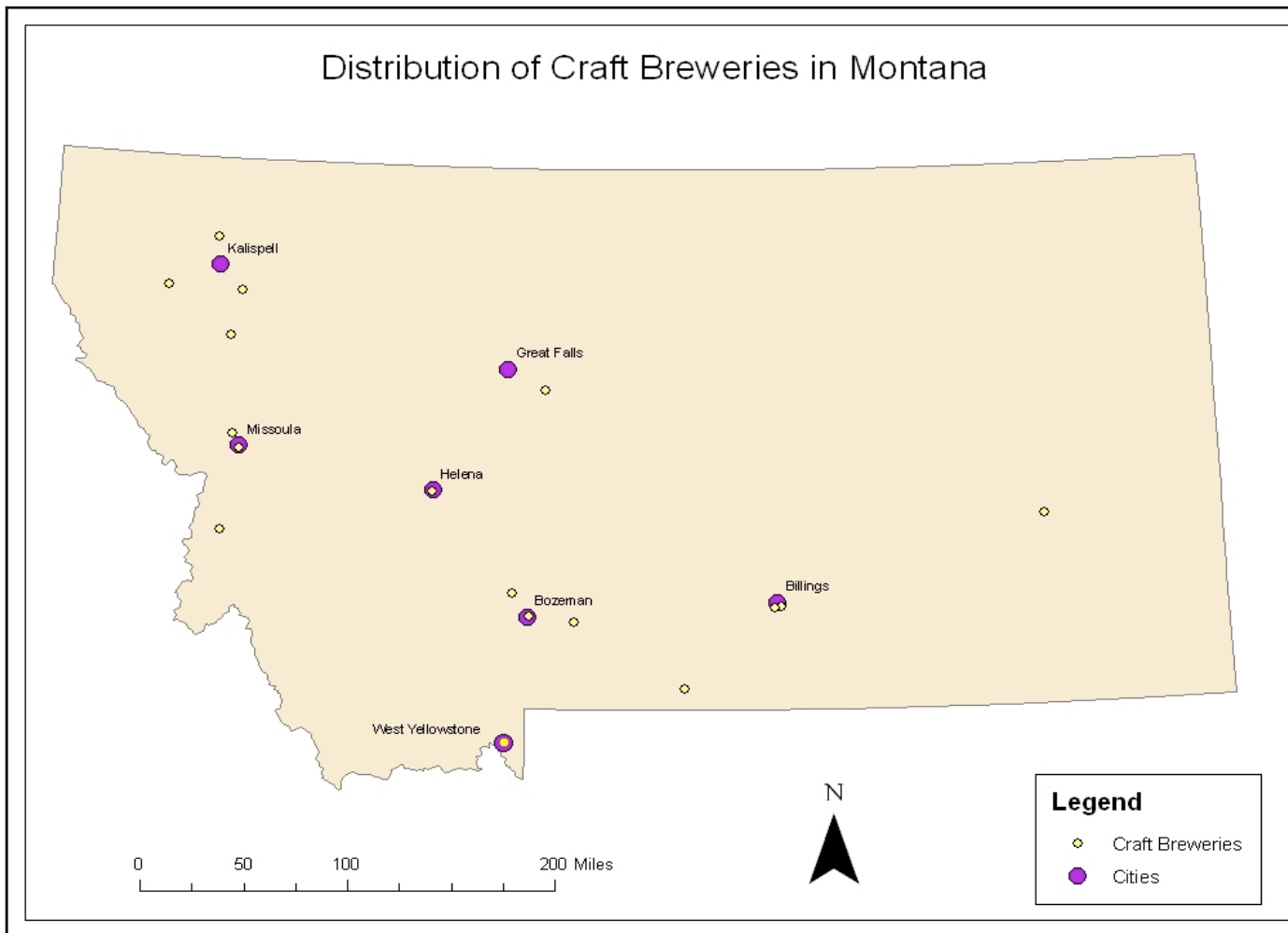


Figure 3.10: Distribution of Craft Breweries in Montana

Another similarity of Montana to the other two leading states in the ratio of breweries per 100,000 residents is the surprisingly small percentage of residents in the age range 25-34, the age group said to be responsible for the majority of craft beer consumption (*Beer Industry Update* 2002). While the two New England States fell well below the national average in their percentages of respective state populations within this age group, Montana comes in last place in this ranked ordering of states. Based on the success of craft brewing in the state, it appears that Montana is unaffected by its dearth of this seemingly profitable portion of the population.

Another characteristic of Montana that would seem to be counterproductive to the success of craft brewing is median household income. Montana falls well below the national average. Further, the state of Montana has the lowest median household income of any state in the Mountain West division as well as the West region. The 47th place in this ranked ordering, combined with the paucity of residents in the 25-34 age range, would seem to indicate that craft brewers would have difficulty succeeding in such a market. The lack of these seemingly necessary factors for the continued success of craft breweries in the state suggests strongly the role that nonresidents are playing in keeping the breweries afloat. It is not surprising, then, to note that Montana ranks fourth among states in the percentage of the state's GDP that is devoted to tourism promotion. A plethora of recreational activities, combined with the presence of two extremely popular national park destinations (Yellowstone and Glacier), serve as important draws in bringing tourists in from other states.

Maclean (1975) reminisced about the "good old days" of life in the first half of the twentieth century in his classic tale of fly fishing in western Montana, "A River Runs

Through It". Thinking back to the days of his life as a young adult, drinking beer along the Big Blackfoot River, the author recalled that, "It would be a beer made in the next town if the town were ten thousand or over. So it was either Kessler Beer made in Helena or Highlander Beer made in Missoula that we left to cool in the Blackfoot River. What a wonderful world it once was when all the beer was not made in Milwaukee, Minneapolis, or St. Louis" (Maclean 1977, p. 88) Merely a few years after the time of Maclean's writing, the craft brewing phenomenon took hold, and has since transformed the Big Sky state's brewing environment closer to how Maclean recalled the state of brewing more than half a century ago. Although for different reasons (sans considerations of transport, refrigeration, and spoilage), both Missoula and Helena are again producing beer, and are perhaps reaping the benefits of the enticing image that Maclean painted of the inviting fly fishing landscapes of the state. Given the more recent founding dates of several craft breweries in the state of Montana, the argument could be made that it wasn't so much Maclean's initial writing as it was Redford's (1992) adaptation of Maclean's story into the film *A River Runs Through It* that spawned the renaissance of craft brewing in the fly fishing country of western Montana. Regardless of which of the two related publications was more influential in showcasing the tremendous fly fishing opportunities available within the state, craft breweries throughout the state are now playing off of this image and frequently associating their beers with fly fishing in their naming of beers.

The largest volume craft beer producer in Billings, The Yellowstone Valley Brewing Company, capitalizes on the fly fishing opportunities available in the area by naming the majority of its beers after flies used in trout fishing: Grizzly Wulff Wheat,

Renegade Red Ale, and Wild Fly Ale. The brewery takes the fly fishing image a step further by also naming their non-alcoholic beverage, root beer, after a trout fishing fly as well: Wooley Bugger Root Beer (<http://www.yellowstonevalleybrew.com/>) . Several other breweries follow the trend of making references to the popular Montana activity of fly fishing. Bayern Brewing Company's Dancing Trout Ale, Blackfoot's Woolly Bugger, and Big Sky Brewing Company's Trout Slayer Ale provide evidence of this distinct marketing technique (Figure 3.9).

Another interesting trend that is gleaned through the analysis of naming techniques employed by craft brewers in Montana is the relative lack of historical references. Compared to Vermont and especially Maine, little attention is given to historical figures and events. The only major exception to this is Helena's Lewis and Clark Brewing Company's obvious reference in the name of the brewery being named after one of the most famous expeditions of the nineteenth century (<http://www.lewisandclarkbrewing.com/main.php>). For the most part, the natural environment and recreational activities afforded by them seem to dominate the marketing techniques of Montana craft brewers.



Figure 3.11: Images of Fly Fishing References Made by Montana Craft Brewers

Sources: www.yellowstonevalleybrew.com, www.blackfootriverbrewing.com,
www.bayernbrewery.com

Middle of the Road Craft Brewing States:

The previous analysis of the three leading states in terms of the ratio of craft breweries to the total resident population was useful to understand specific factors related to why an area can be so successful in fostering smaller, more locally-oriented breweries. So, too, can an analysis of “mediocrity” in craft brewing at the state level. Comparing aspects of craft brewing in states that fall in the middle of the pack to those at the top of the list should reveal some differences in terms of the degree of success based on state-specific characteristics. This portion of the analysis will evaluate specific factors and their relationship to craft brewing in the three states falling in the middle of the pack. The three states of South Dakota, Pennsylvania, and Missouri fit the distinction of being the three “middle-most” states based on the ratio of craft breweries per 100,000 residents at the state level.

3.5 South Dakota

The predominantly rural state of South Dakota, located largely in the Great Plains region, has four craft breweries operating within its borders (Figure 3.12). Of the four breweries operating in the state, only one is located outside of a metropolitan area, Dempsey’s in Watertown, while the other three are located in the metropolitan areas of Sioux Falls and Rapid City. Compared to the three leading states, the lower percentage of craft breweries operating outside of a metropolitan area seems to serve as an indicator of the lower rate of penetration of craft brewing in this state.

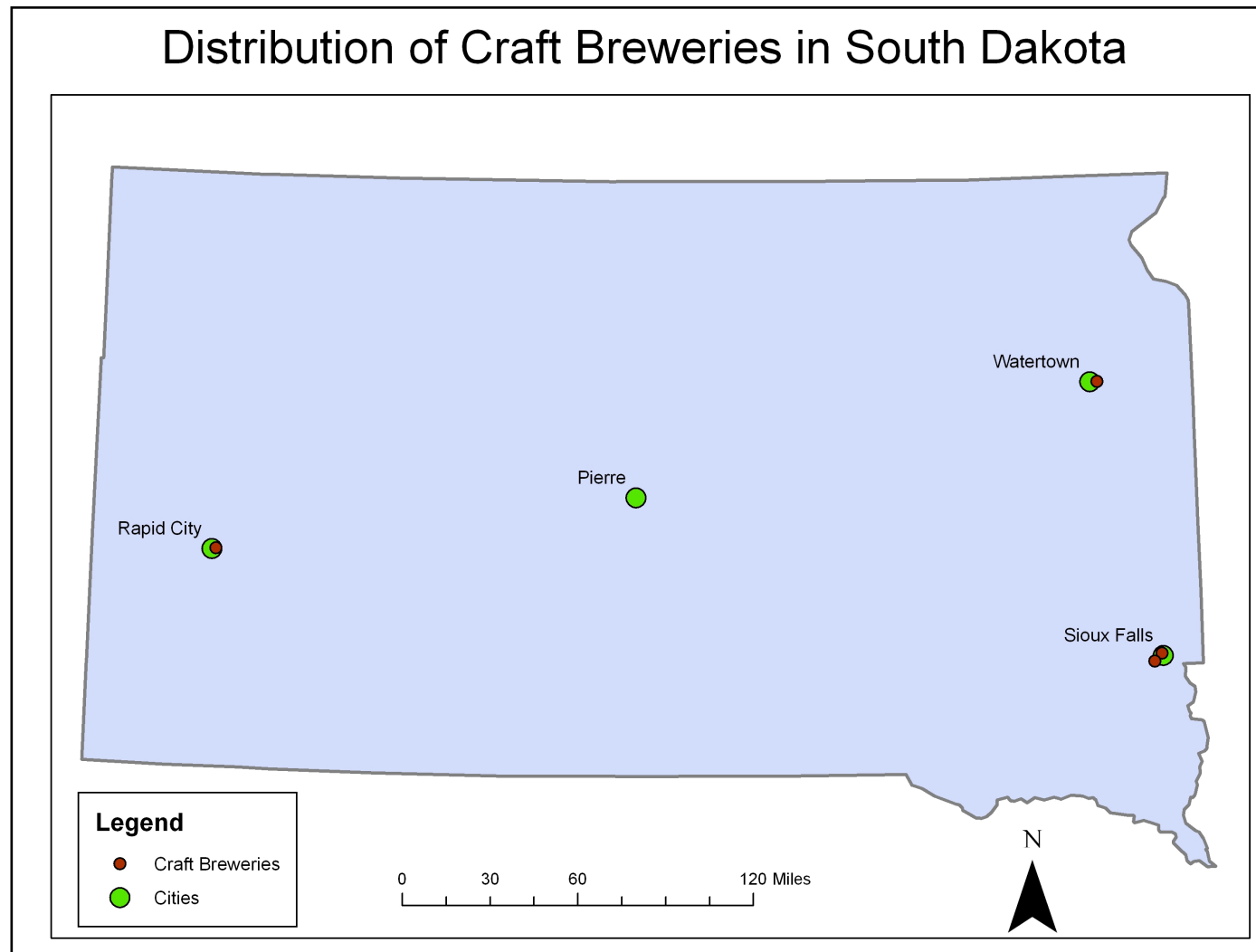


Figure 3.12: Distribution of Craft Breweries in South Dakota

Given the importance of the Black Hills as a tourist mecca, South Dakota, somewhat surprisingly, ranks 24th in the percentage of the state's GDP that is devoted to the promotion of tourism. In addition to the lack of large population centers that could provide a potential tourist draw from surrounding states (as seems to be the case with Maine and Vermont), the eastern portion of the state's rather bland topography and recreational opportunities (when compared to a state like Montana whose craft breweries market heavily to fly fishers and other outdoor enthusiasts) do not fare well for tourist activities. The Black Hills/Badlands region, on the other hand, and the presence of the Firehouse Brewing Company in Rapid City is likely a consequence of the tourist presence in the area.

South Dakota's low status in median household income (42nd place) does not bode well for the state's craft brewing environment. The lack of a resident population with a large amount of disposable income to purchase the more expensive craft beers, coupled with a dearth of recreational or other tourist-based activities in the more populous eastern portion of the state, does not appear to help the state's craft brewing situation. In addition to the relatively low median household income, the breakdown of South Dakota's resident population does not fare well for local brewing success. South Dakota does not possess a large percentage of residents in the 25-34 age cohort, the group most responsible for the majority of craft beer consumption. With only 12% of residents falling into this age grouping, South Dakota ranks among the lowest of all states in this distinction (49th place), further reflecting the lack of appeal of craft-brewed beers to the resident population.

Bourdieu's (1984) belief that the consumption of higher brow products is directly related to one's educational upbringing and attainment serves as additional evidence of South Dakota's failure to make it to the top of the list of craft brewing states. South Dakota ranks 37th in the percentage of a state's population with an advanced degree, with only 16.3% of its residents possessing a bachelor's degree or higher. The lack of major universities found within the state, as well as a paucity of employment opportunities available to keep educated residents within the state, are possible explanatory factors of the low percentage of residents with a higher education.

Of the four breweries that are present within the state, three of the four are located in the large population centers within South Dakota. The only non-metropolitan brewery, Dempsey's, is found in Watertown, a small city that markets itself as having all of the characteristics necessary for a successful craft brewery. Referred to as "South Dakota's Rising Star", Watertown's Chamber of Commerce deems the city a, "Quiet, safe, progressive city...plus other cultural and historical attractions, unique shopping, great accommodations, entertainment, and...great hunting, fishing, swimming, and camping at our beautiful lakes." (<http://www.watertownsd.com/>) This small city clearly caters to tourism, where visitors can take advantage of both cultural and outdoor recreational activities. Dempsey's Brewery, Pub, and Restaurant has an Irish theme, complete with a brewmaster who will play the bagpipes for customers upon request. However, the brewery does not make any efforts to equate its beers with the local geography or activities available in the area .

The other three craft breweries of South Dakota are located in Rapid City (1) and Sioux Falls (2). The brewery in Rapid City, Firehouse Brewing Company, is in an ideal

tourist location as well. Its location along Interstate 90 attracts many through travelers to the Black Hills and Mount Rushmore sites. Despite not naming one of their brews after the monument to the presidents depicted on the monument carved into a nearby hillside, the brewery does incorporate some local references into the names of beers. Chukkar Ale is named after a popular game bird introduced to the area, and Smoke Jumper Stout makes reference to the forest fire fighters who jump from airplanes to fight fires in the rugged terrain (www.firehousebrewing.com).

The other two breweries are located in Sioux Falls, the largest city in this state of 750,000 residents. Laughing Waters Brewing Company and Granite City # 2 are located within the Sioux Falls metropolitan area. Granite City is part of a larger chain of craft breweries, and none of the beers that are offered by this brewery are locally oriented. Additionally, no seasonal beers are offered, an area where many craft brewers are able to take advantage of local, seasonal conditions in equating their beers with season-specific activities or phenomena. Laughing Waters Brewing Company is located near the waterfall (hence the name Sioux Falls) and this obviously influenced the decision in naming the brewery. One beer of note from this brewery is their hemp ale, which is apparently geared toward the more liberal, hemp-appreciating segment of the population.

3.6 Pennsylvania

The Middle Atlantic state of Pennsylvania has 62 craft breweries operating within its borders compared to the state's resident population of 12.3 million, making it the 25th ranked state based on the ratio of 'craft breweries per 100,000 residents' (Figure 3.13).

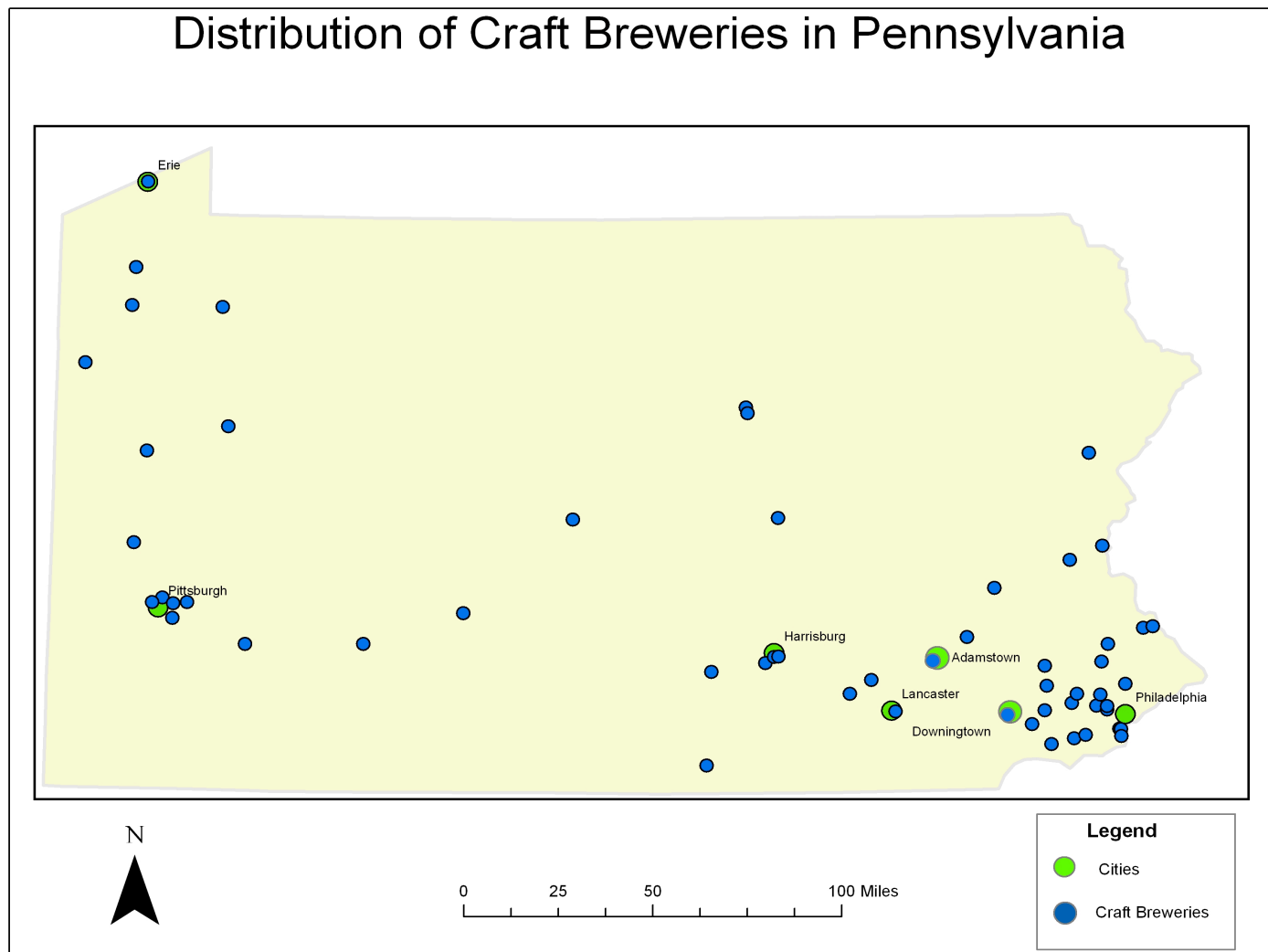


Figure 3.13: Distribution of Craft Breweries in Pennsylvania

The locations of the breweries are anything but ubiquitous. While breweries are present throughout the state, a disproportionately large number are found in the eastern half. This seems to reflect the cultural divide between the two sides of the state, where the predominantly rural western side of the state is lacking when compared to the larger cities of the eastern half of Pennsylvania. An overwhelming majority of Pennsylvania's craft breweries (85.5%) are located within the state's metropolitan areas, with the remaining 14.5% operating in non-metropolitan settings. More than one-third of craft breweries operating within the state are found within the Philadelphia MSA alone. Pennsylvania shares with South Dakota the similarity of having at least three quarters of its craft breweries in metropolitan settings. Thus, Pennsylvania and South Dakota are in contrast to the three top-tier states (Vermont, Maine, and Montana), which have a majority of their craft breweries in non-metropolitan areas.

Based on the statistic of 'tourism dependence', Pennsylvania is not among the top states in terms of seeking revenue through the promotion of tourism; the state ranks in 45th place the percentage of a state's GDP that is devoted to tourism investment. The degree to which tourism is emphasized at the state level seems to be of primary influence on the extent of craft brewing success at least in the top craft brewing states. The small relatively percentage of dollars invested into Pennsylvania tourism and the state's mediocre status as a producer of craft beers seem to go hand-in-hand.

With a median household income of \$40,106, Pennsylvania falls slightly below the average among states, ranking 29th. The relatively low amount of disposable income, on average, probably negatively influences the number of consumers who are able to

invest in higher priced, higher quality beers⁶. Extreme intrastate variations in household incomes are masked by such a statewide statistic. Variations in a more localized analysis of craft brewing seem to reveal the influence of household incomes, where the richer counties of suburban Philadelphia (i.e. Bucks, Montgomery) tend to have higher than average instances of craft brewing than do many of the poorer, rural counties found in the northern and western portions of the state.

Pennsylvania's small percentage of young people also helps to explain the only moderate degree of craft brewing success. The state ranks 43rd in terms of the percentage of the resident population falling within the age range of 25-34, the group supposedly responsible for the largest percentage of craft brewed beer purchases. This is, at least in part, a result of the migration of young people away from the economically struggling area in search of more suitable employment opportunities outside of the state (Florida 2002). Without a large proportion of young people, craft brewers might be hesitant to invest in opening a brewery in a state devoid of this important population segment.

Pennsylvania also ranks in the middle among states in the percentage of the state's population with at least a bachelor's degree. At 17.5%, Pennsylvania ranks 27th in terms of the percentage of a state's residents with an advanced degree. This statistic, too, is consistent with the state's middle-of-the-road provision of craft brewed beer. If Bourdieu's (1984) assertion that the consumption of higher-order products (such as craft-brewed beers) among more highly educated individuals is correct, then the relatively small proportion of Pennsylvania's residents with advanced educational credentials could

⁶ Equating higher prices with higher quality beers is not merely a personal value judgment by the author. Based on rating systems and awards given at national and international beer festivals, the higher-priced craft beers consistently win awards over the beers produced by large-volume producers of beer (i.e. Anheuser Busch, Miller, Coors).

serve as an explanatory factor for the state's mediocre status. Given that the status of beer is on the rise in terms of being viewed as an acceptable, appealing alternative to wine, the effects of the perceived status of consumers of craft brewed beer is on the rise as well (Stone 2008).

Given the large number (62) of craft breweries found in Pennsylvania, it will not be possible to individually analyze the marketing techniques employed by all breweries. I will, therefore, focus on some of the larger breweries found throughout the state. Based on available data for annual production volumes, the largest producer of craft beer in Pennsylvania is Victory Brewing Company of Downingtown. At nearly 30,000 barrels of beer produced in 2006, the Victory Brewing Company's distribution far exceeds the local market. Although their labels boast that the beers are locally created, little additional attention is paid to the local environment in the naming of beers or labeling designs. The only possible exception is the scene depicted on their Sunrise and Weizen Bock beers of a large farmstead amid the gently rolling hills which is characteristic of central and eastern Pennsylvania. Other than that exception, the brewery makes little attempt to sell scenes and images of the local environment. The location-neutral naming and designs of beers, instead of selling the local conditions, seem to purposely steer clear of any local associations in an attempt to appeal to consumers far and wide (www.victorybeer.com). This is in contrast to the largest producer of another state, Vermont, where the Magic Hat Brewing Company acknowledges and attempts to sell the local culture, as well as the regional craft producers of Portland, Maine whose beers are a reflection of local economic activity. However, Victory Brewing Company's strategy of placelessness seems to work well for consumers both inside and outside of Pennsylvania. (Figure 3.14).



Figure 3.14: Images of Victory Brewing Company's Beer Labels

source: www.victorybeer.com

Troeg's Brewing Company of Harrisburg is the next largest volume producer of craft beers in Pennsylvania for which data are available. At approximately one-third the output of Victory, Troeg's Brewing Company has adopted a similar strategy of placelessness. With names like Sunshine Pils, Hopback Amber, Dream Weaver Wheat, and Rugged Trail Ale, these beers are clearly being marketed to consumers regardless of place. Nowhere on a label is a site-specific location depicted—no scenes in or around Harrisburg are shown on a label. Founded by brothers Chris and John Troegner, natives of nearby Mechanicsburg, the brewery came into being through outside influences. While one brother was employed at a Philadelphia brewpub, the other was living nearly 2,000 miles away in the booming craft beer town of Boulder, Colorado. The result of these disparate craft beer-related influences was their founding of the brewery in Harrisburg in 1997 (www.troegs.com). Similar to Victory Brewing Company, this brewery is also able to be successful while avoiding any direct marketing of “localism”.

Stoudt's Brewery, located in the tiny town of Adamstown, clearly reaps the benefits of its proximate location to one of Pennsylvania's most important roadways: The

Pennsylvania Turnpike (Interstate 76). This brewery became a popular favorite of consumers both within the state and distant areas through a gamble of an investment by brewery owner Ed Stoudt. Nearly twenty years ago, the then-struggling brewpub made the jump to a larger-scale producer by investing in bottling technology (Stoudt 2001). The shift from a small operation limited to on-site sales to distributing to distant markets in the form of bottled beers proved to be a great success for the brewery. Now a producer of over 10,000 barrels annually, Stoudt's has achieved popularity in the large cities of the Northeast. Like the other larger craft breweries of Pennsylvania, Stoudt's, too, refrains from focusing on any local phenomena in their marketing strategies. However, the brewery does emphasize the importance of smallness in their brewing methods, citing the small, hardworking staff as being a key component of their successful brewing operation (<http://www.stoudtsbeer.com/brewery.html>).

Lancaster Brewing Company, at nearly 6,000 barrels of production volume, is the largest craft brewery in Pennsylvania that does incorporate an aspect of the local culture into a naming convention. Their Amish Four Grains beer pays tribute to the one of the largest Amish communities in America, which is also a big selling point for tourism in the area. The overlap between tourism to the area and the brewery's association with the draw of the area go hand-in-hand, where visitors to the area can enjoy a "taste of the local area" through the consumption of beer (www.lancasterbrewing.com). (Figure 3.15)

Again in the eastern half of the state, Appalachian Brewing Company of Harrisburg, another bottling operation, incorporates images and associations of the local area in several of its brews. The majority of the flagship beers of this brewery are closely



Figure 3.15: Image of Lancaster Brewing Company's Amish Four Grain Ale
source: www.lancasterbrewing.com

associated with local phenomena. Water Gap Wheat is so named because of the water gap created by the Susquehanna River is older than the surrounding mountains, creating this important natural transportation aid. Due to its proximate location to the Appalachian Trail, two beers, Purist Pale Ale and Hoppy Trails I.P.A., receive acknowledgement. The Purist Pale Ale is named after the elite fraternity of hikers who cover every step of the trail during their hike, and the Hoppy Trail provides an easy play on words while referencing the most famous hiking trail in America. The Mountain Lager, “Is a tribute to the Appalachian Mountains where we live and play,” and the Susquehanna Stout pays homage to the waterway near to where the brewery is located. On several bottle labels, examples of the local architecture (such as the Broad Street Market building) are proudly displayed (<http://www.abcbrew.com/>). The seasonal brews produced by Appalachian Brewing Company also are heavily oriented to the local environment. Pennypacker Porter is the sole reference to politics—as the state capital, Harrisburg serves as the center of state politics, and this dark beer pays tribute to the governor who was in office when the capitol building was constructed. Kipona Fest is a Marzen-style beer that was named after the Labor Day festival held in downtown

Harrisburg, and Sophie's Sparkling Ale, a summer brew, is said, "To have the perfect carbonation and crispness on...summer's hot and humid Pennsylvania days." The brewery's output of slightly more than 5,000 barrels might serve as an explanatory factor in the way in which the Appalachian Brewing Company's products are marketed. With a smaller production volume than the other breweries investigated, the decision to incorporate so much of the local culture, scenery, and topography in the naming of beers is probably a product of a more proximate market of consumers. Without the need to sell their beers to more distant beer drinkers, the brewery is able to capitalize on establishing an affinity between the locally produced beers and local phenomena (Figure 3.16).

Figure 3.16: Images of Appalachian Brewing Company's Beer Logos



source: www.abcbrew.com

3.7 Missouri

In 27th place based on its ratio of breweries to 100,000 residents, Missouri boasts slightly greater than 0.5 breweries per 100,000 residents in the state. Of the three middle tier states analyzed, Missouri has the great occurrence of breweries outside of large population centers: only 19 of its 28 craft breweries (67.9%) are located in metropolitan areas, while the remaining nine are situated in areas with smaller populations (Figure 3.17). All but one of the metropolitan breweries are located in the two largest cities: Kansas City and St. Louis, with the St. Louis MSA containing the greatest number (11).

Missouri ranks 35th in median household income, a figure that does not bode well for a large amount of craft-brewed beer consumption among state residents. Given the global hops shortage and increasing prices of higher quality beers (Stone 2008), the lower-than-average income level at the state scale decreases the likelihood of a high success rate of craft breweries in Missouri. A larger percentage of disposable income is necessary to purchase beers that are produced in smaller batches and made with higher quality ingredients than is required to purchase a cheaper beer such as Budweiser, the world's largest beer brewing operation whose headquarters is St. Louis. Similarly, its ranking of 33rd when comparing the percentage of young adults (25-34) among the state's total population may negatively influence the success and furthering of craft brewing in the state. Furthermore, Missouri also ranks in the bottom half among states (33rd place) in its percentage of residents with an college degree. Given the correlation between successful craft brewing at the state level and the average education levels of residents, this could further explain why, at the state level, Missouri's ratio of craft breweries to 100,000 residents is not among the top tier of states.

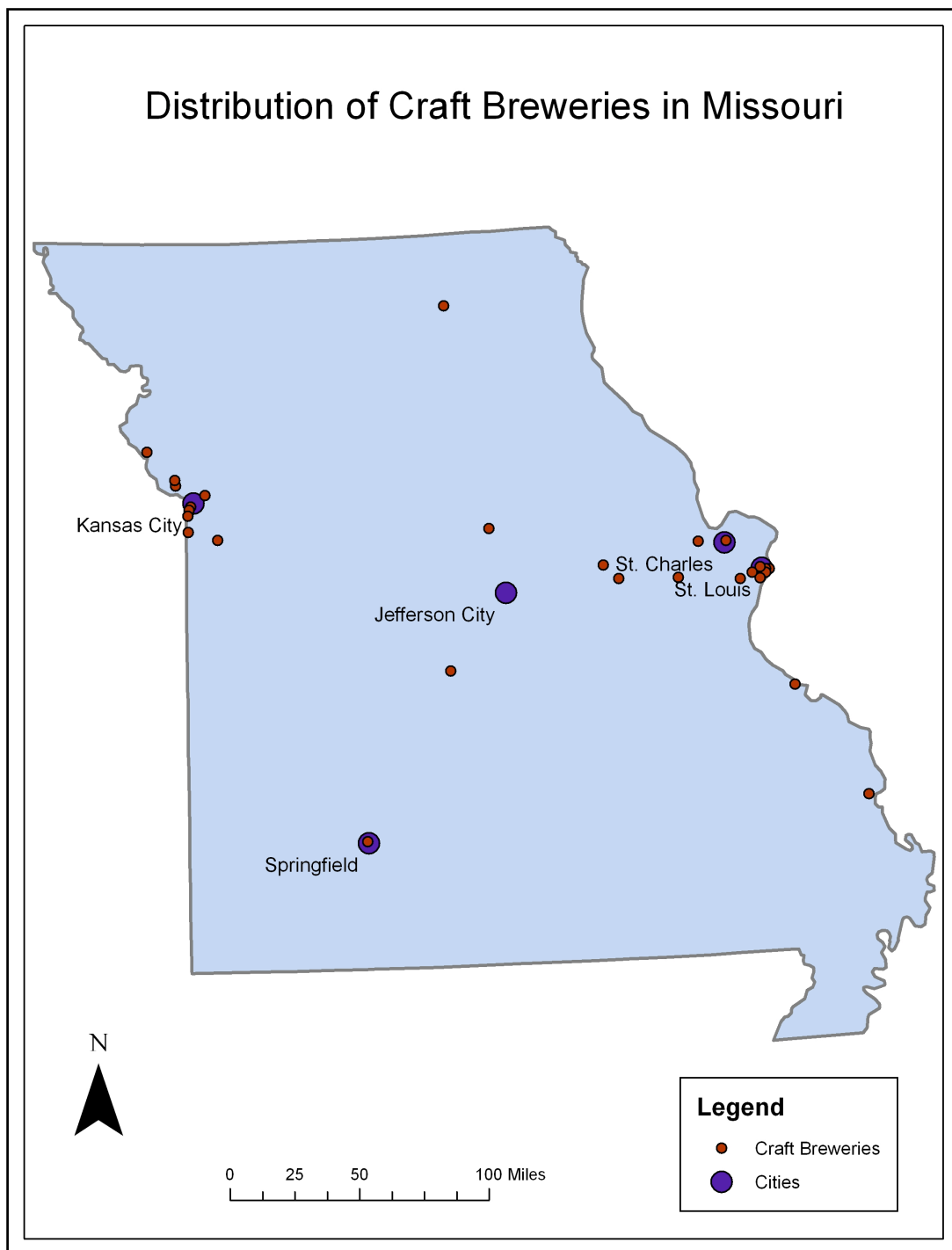


Figure 3.17: Distribution of Craft Breweries in Missouri

At 5.2% of its GDP devoted to tourism promotion, Missouri ranks 21st among states in this category. Assuming that this form of boosterism is successful, this could serve as a beneficial element in bringing potential consumers to the state, providing additional opportunities for craft brewers to sell their beers. Missouri's relatively high position in this category could be responsible for the founding and continued success of several breweries operating in areas that do not have large resident populations (i.e. the recreational-based tourist destinations in the southwestern portion of the state).

Another point to ponder when analyzing craft brewing in Missouri is the dominance of the Anheuser-Busch Corporation. This brewery, the producer of the globally recognized Budweiser, is the largest brewing operation in the world, with production facilities spanning the globe (Figure 3.18). With its American headquarters located in St. Louis, Missouri and its influences in the forms of advertising and marketing campaigns spreading outward from the corporate offices, the potential influences that could be felt by local residents could serve as a deterrent from drinking any other beers. On the other hand, it is possible that craft breweries and the mega-producers have little to no interference in their market segmentations. Resource Partitioning Theory (Carroll and Swaminathan 2000) suggests that these two types of breweries, generalists (i.e. Budweiser) and specialists (craft breweries), are able to coexist by focusing on different segments of the market. While Budweiser is able to cater to the larger, heterogeneous segment of the market, the craft producers cater to the tastes of a smaller niche market of beer drinkers who are unwilling to accept the tastes of a lighter beer such as Budweiser. The presence of eleven craft breweries in the St. Louis metropolitan area seems to support the latter assertion that there is little overlap between the two types of beer

consumers. If all beers were created equal, it would be difficult to imagine that another Budweiser-like beer would be capable of competing in Missouri, and St. Louis, more specifically, due to economies of scale in production, advertising, and, perhaps more importantly, prohibitive distribution systems.

Just as Missouri is home to the world's largest brewery of any type, it is also home to the largest producer of craft beers in the Midwest. Boulevard Brewing Company of Kansas City produced over 115,000 barrels of beer in 2006, dwarfing all of other craft breweries in the region. Founded in 1989, the brewery came into being in an old restored

Figure 3.18: Anheuser-Busch Production Facility, Wuhan, China



The immense Anheuser-Busch production facility in Wuhan, Central China, is representative of the global reach of the St. Louis-based brewing giant (photograph by James Baginski).

building, a common occurrence in the world of craft brewing. As the website boasts, Boulevard beers have drastically outgrown their local market, and are now distributed throughout thirteen states. Given the large market served by this brewery, the lack of site-specific references comes as little surprise. The extent of any local reference found on a Boulevard Brewing Company label is on their Wheat Beer, which depicts bales of wheat amid a large open field, a scene typical throughout much of the Midwest (<http://www.blvdbeer.com/beer.htm>) .

The Saint Louis Brewing Company/Schlafly Bottleworks is the second largest volume craft producer in Missouri, with an annual production volume of more than 15,000 barrels in 2006. Although devoid of any direct criticisms of Budweiser, their large, indirect competitor also located in St. Louis, the brewery refers to their production as, “Beer the way it used to be,” emphasizing the small-batch production and traditional brewing techniques. Seven beers in a variety of styles are available throughout the year, while nearly thirty seasonal brews are available at various times throughout the year (<http://www.schlafly.com/>). As was the case for the larger craft producers in Pennsylvania, this large Missouri craft brewery also steers clear of creating any place-specific associations with their beers.

With a much smaller output, O’Fallon’s brewery also hails from the St. Louis MSA. Despite its much smaller volume (2,726 barrels), the brewery still ships their products far and wide. Perhaps their distribution outside of Missouri to Illinois, Iowa, Kansas, Kentucky, Michigan, Pennsylvania, and Wisconsin helps to explain how their beers are marketed. In other states analyzed, breweries with an annual output as small as this tended to cater more to the local consumer, but O’Fallon’s Brewery clearly attempts

to appeal to consumers far from the brewery's location in Saint Charles County. Their flagship beers, O'Fallon Gold, O'Fallon Wheat, O'Fallon Smoked Porter, and O'Fallon 5-Day IPA, along with their seasonal brews, stick to generic, non-place-specific naming and labeling. In comparing the production volume and distribution market to their naming and marketing strategies, it seems as if this brewery is essentially avoiding the "local" phase that many of the now larger craft breweries catered to in their infancy.

Moving down the production hierarchy, the first Missouri craft brewery for which data are available that favors a more locally-oriented marketing strategy is Trailhead Brewing Company in St. Charles. Although the brewery does bottle, prohibitive alcohol-related laws prevent the brewery from distributing their beers to other locations. The locally-oriented strategy is, therefore, easily embraced due to the "mandated" proximate consumer base. Similar to the locational decisions of so many other craft breweries, their 1,600 barrels of production are brewed in an old grist mill that was converted into a craft brewery in 1995. Even the name of the brewery is a local reference—in addition to being positioned near the Katy Trail, a biking trail that spans the majority of Missouri's width, the brewery's name has historical implications as well. The town of St. Charles was the site of Lewis and Clark's departure for their exploration of the 1803 Louisiana Purchase. Their Trailblazer Blond Ale and Trailhead Red Amber Ale both make reference to the past and present significance of the word "trail" in the area. Riverboat Raspberry Fruit Beer is so named because of the historical connections with the large passenger ferries on the Mississippi River, Missouri Brown Dark Ale uses the state's name, and the Old Courthouse Stout likely refers to an historical structure in the town of Saint Charles (www.trailheadbrewing.com).

Bottom of the Barrel States

If the most successful states were useful in determining the underlying factors influencing the most well-represented states in craft brewing and the middle states provided insight into why they (the three states of South Dakota, Pennsylvania, and Missouri) were only moderately successful, so, too, should the lowest level states reveal important information as to why the three states of Louisiana, Kentucky, and Mississippi are not able to foster a large number of craft breweries. The most obvious similarity between the three lowest states is their location in the South. All three states are located south of the Mason-Dixon Line, with two of the three being part of what is commonly referred to as “The Deep South”. It is highly unlikely that the three most poorly represented states in their ratios of breweries per 100,000 residents are located in the South solely by chance. Although this portion of the analysis will focus only on these three states, it is important to point out that eight out of the ten worst states in craft brewery provision when population is considered are southern states. None of the southern states rank even in the top 30 in terms of craft breweries per 100,000 population. It would seem, therefore, that some cultural factor(s) is (are) at work in preventing the success of craft brewing throughout the South.

3.8 Louisiana:

The Gulf Coast state of Louisiana ranks 49th in its ratio of craft breweries per 100,000 residents, with approximately 0.13 breweries per each 100,000 residents. Of the five craft breweries operating within the state, all six are found in metropolitan areas. Five of Louisiana’s six craft breweries are located within the New Orleans MSA, and the

remaining facility operates in Lake Charles (Figure 3.19). Clearly the craft brewing phenomenon has not diffused hierarchically: craft brewing in Louisiana is limited to large population centers, chiefly New Orleans.

The role of religion cannot be ignored when evaluating the extent and location of craft breweries in Louisiana. The southern portion of the state, due to its historical French influence, is predominantly Roman Catholic, a religion that is not opposed to the consumption of alcoholic beverages. Conversely, the predominant religion of northern, non-coastal Louisiana is Baptist, a conservative Christian denomination, and no craft breweries are present in this portion of the state (Figure 3.19). Baptists are not nearly as accepting of alcohol consumption as are Roman Catholics, and can thus influence the prohibition of its sale, production, and distribution. Louisiana state law permits local political entities to enact restrictions that prevent the production, purchase, possession or consumption within a local political unit with no limitations on how the decision to do so is reached (LA R.S. Section 26:147). Therefore, local governments in areas that look down on the consumption of alcohol can prohibit it without answering to the larger state governing body. With this in mind, it is not difficult to understand how the ideological principles of the northern, Baptist part of the state could be manifested in political legislation to prevent the founding of a craft brewery or any other type of alcoholic beverage production facility.

Consistent with the state's low rate of craft brewery provision is Louisiana's median household income. With an average household income of \$32,556, it ranks 48th among states, higher than only three other southern states. This figure helps to explain, in part, why such a small number of craft breweries exist within the state. The higher-than-

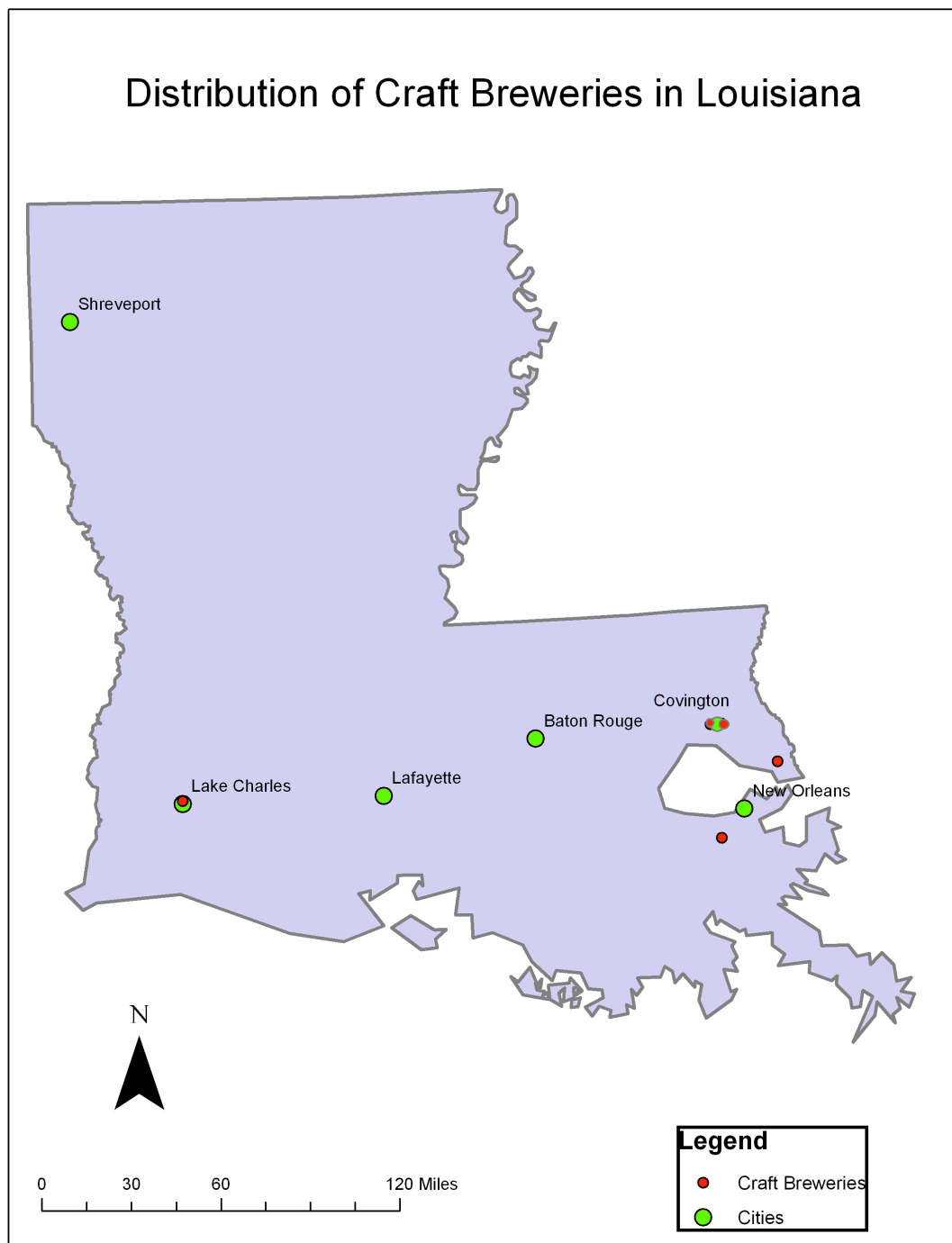


Figure 3.19: Distribution of Craft Breweries in Louisiana

average costs of craft-brewed beer are probably not a viable option for frequent consumption by a substantial portion of the population. Investment in a craft brewery in the state would be difficult to justify based on the knowledge that such a large portion of the state's residents do not have the financial means to purchase more expensive beers. Furthermore, increasingly problematic cost-related factors (e.g. the global hop shortage, the rising fuel prices and their effects on the shipment of both inputs and outputs) are increasing the prices of the already more expensive craft-brewed beers.

One factor that would seem to support a greater number of craft breweries that are actually operating in Louisiana is the presence of a large percentage of the state's residents between the ages of 25 and 34, the age cluster cited as being the largest consumers of craft-brewed beer. In this category, Louisiana ranks 28th, ahead of all three top-tier craft brewing states. This seems to suggest that a larger percentage of residents in this age group (13.5% for Louisiana) alone is not sufficient in influencing extensive craft brewing developments. Other factors must work in conjunction with a larger-than-average percentage of a particular population's residents falling within the 25-34 age range, the group cited as being the consumers of more craft brewed beers than any other age group. For example, a large percentage of 25-34 year olds in a predominantly Baptist area would serve as no positive influence to the future of craft brewing in a particular locale.

According to the Beer Industry Update (2002) study, only 6.5% of purchasers of the craft brewed beers included in the study were African Americans. Louisiana has nearly three times the national average of black residents, with 31.7% of its residents categorized as African Americans. The larger than average percentage of African

Americans together with their low propensity to consume craft beers, could help to further explain the poor craft brewing situation in Louisiana. On the other hand, the lower-than-average incomes of the African American segment of the population could serve as an explanation, where many members of Louisiana's black community are unable to afford the more expensive craft beers.

The extremely low percentage of residents in Louisiana who have received bachelor's degrees from a university serves as another explanatory factor for the state's poor provision of craft-brewed beer. With only 13.9% of residents in possession of a bachelor's degree or higher, the state falls into the bottom tenth of states when ranked based on the percentage of residents in a respective state with an advanced degree. Assuming that craft-brewed beers fall within the category of products that can be purchased as a means of social distinction, in part a product of the extent of one's education, then Bourdieu's (1984) assertion that consumption can be used to distinguish oneself in terms of class helps to understand an additional facet of Louisiana's low status among craft brewing success by state.

The sole factor condition being evaluated in this portion of the analysis that Louisiana does rank relatively high in is the portion of the state's GDP that is used to promote tourism. The state ranks 12th in this category, devoting 5.9% of its gross domestic product to the promotion of tourism. In all three of the top craft brewing states, a high percentage of tourism promotion was equated with overly successful craft brewing. However, in the case of Louisiana, its above average tourism investment does not seem to equate with success in craft brewing. Although it has been stated that in many northern areas within the state, alcohol consumption is not highly regarded (in

some cases, even outlawed), this clearly is not the case of the state's largest city: New Orleans. The city is home to the nation's largest Mardi Gras celebration, a multi-day party that is characterized by, above all else, excessive alcohol consumption.

Of the six breweries operating within the state, five are extremely limited in their production output, ranging from a low of 20 barrels to 600. The only exception to the small production volume of a Louisiana craft brewery is the Abita Brewing Company, the primate craft brewery of the entire South. Its 62,000+ barrels of production set it apart from all other producers of craft brewed beer within the state. Much like many other larger volume craft beer producers, The Abita Brewing Company's beers refrain from any associations with the local environment. The generic names (such as Abita Bock, Abita Light, Abita Amber, and Abita Wheat) are able to appeal to a large geographic range of consumers by not focusing the beers' names on the immediate geography of the area. Despite a lack of local associations in the names of their beers, the brewery boasts that its growth as a popular regional beer is still based on small batch production by a dedicated team of workers with an emphasis on pride (<http://www.abita.com/learn/history.html>). Its location within the brackish swamps of south Louisiana could leave potential consumers wondering how one of the key inputs in the brewing process, water, could be of high enough quality. The brewery actively averts this concern, however, by proudly declaring that the brewing process utilizes the pure spring water that is available in Abita Springs, as is evidenced on the label of their Bock Beer (Figure 3.20).

At approximately 1/100th the production volume of Abita is the output of Louisiana's next-largest producer of craft-brewed beer: The Crescent City Brew House.

This brewery, with an output of 600 barrels in 2006, is located within the New Orleans French Quarter. Emphasizing its adherence to the Bavarian Purity Law of 1516 (Reinheitsgebot) through the inclusion of only four ingredients (water, malt, hops, and yeast), the brewery offers four permanent brews, as well as seasonal creations available at various times throughout the year. Unlike many other small breweries, the Crescent City Brew House does not exploit its location as a means of marketing, even with its famed tourist location in the French Quarter (www.crescentcitybrewhouse.com). Its physical attachment to place is unavoidable: Crescent City's 'brewpub' status is characterized by on-site beer sales, where beer drinkers are only able to drink the beers of this brewery while at the brewery and restaurant. Heiner Brau's relatively small production volume (580 barrels) does not prevent the operation from bottling their beers for off-site sales. Although it is termed a 'microbrewery', at least 50% of sales associated with the beers of this craft brewery occur off premises. While the bottling strategy is frequently associated with the penetration of distant markets (bottled beer is easily transportable), Heiner



Source: www.abitabeer.com

Figure 3.20: Image of Abita Brewing Company's Bock Beer Logo

Brau's Brewery of Covington, Louisiana still presents an image of being local in nature. In addition to incorporating a 'community news' section of the brewery's website, complete with dozens of pictures of local community members, the craft brewery also takes advantage of creating an association with one of the most famed parties in America with their seasonal Mardi Gras Feistbier (www.heinerbrau.com).

3.9 Kentucky:

Five craft breweries are located in Kentucky, giving it its 50th place ranking among states (Figure 3.21). As was the case with the other poorly represented craft brewing state in the South, Louisiana, all breweries in Kentucky are also found in metropolitan areas. Louisville has the greatest number (three), while Lexington and the portion of the Cincinnati MSA located in Kentucky (Newport) each possess one craft brewery. Again the lack of hierarchical diffusion is evidenced in this southern state—no smaller towns are able to provide the necessary patronage for a successful locally-oriented brewery.

One situational factor that helps to explain the poor brewing situation of Kentucky is the statistic median household income. At a mere \$33,672, the average income level of Kentucky residents does not bode well for the possibility of success in craft brewing. As is the case for the state of Louisiana, a large percentage of the state's residents might not be financially predisposed of purchasing craft-brewed beers. The more costly nature of this type of beer due to the much more costly inputs is unlikely to be successful in a market such as the state of Kentucky. The large intrastate variations in wealth are able to explain why five craft breweries do exist in the relatively wealthier urban areas and none

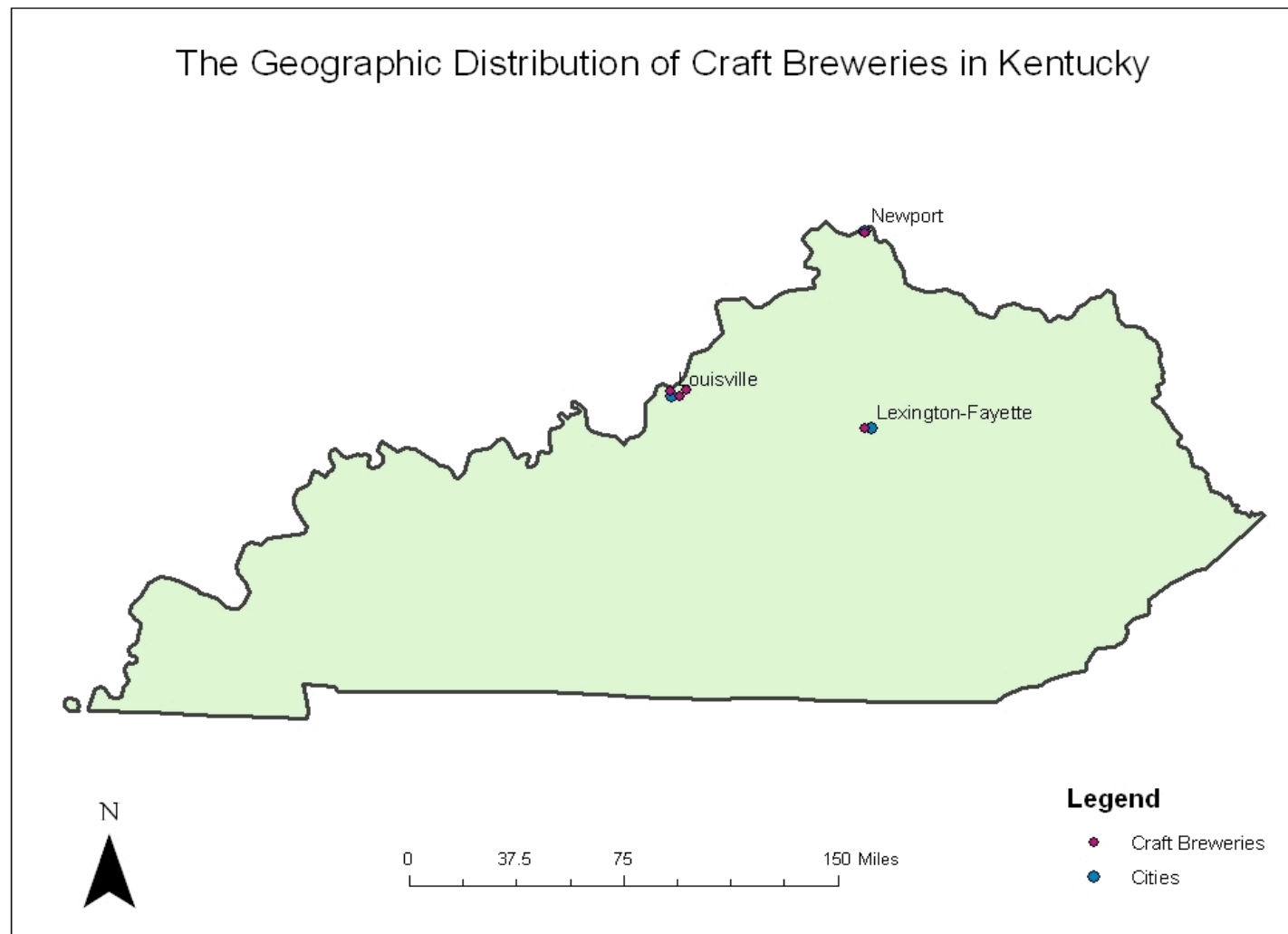


Figure 3.21: Distribution of Craft Breweries in Kentucky

are present in the the Appalachian eastern portion of the state.

Kentucky's higher-than-average percentage of residents falling in the 25-34 age range (20th place) seems to be a positive statistic related to craft brewing. However, as was the case for all of the top-tier states, the percentages of the resident populations within this age range were not overwhelmingly large. Therefore, despite the results of the Beer Industry Update (2002) study implicating this age group as, by far, the largest consumers of craft-brewed beers, the state level statistics do not support this reality. Therefore, the ostensibly positive trait of having a greater than average segment of the population in this age group does not result in a health Kentucky-based craft brewing environment.

Throughout the analysis, one state-level condition that does seem to correlate directly with success (or lack thereof) of craft brewing is the percentage of a state's population that has earned at least a bachelor's degree. In this category, Kentucky ranks very low (48th place), ahead of only three other southern states. With only 13.1% of residents who possess this level of academic achievement, this seems to serve as quality evidence of why Kentucky struggles so severely in the area of craft brewing.

The state of Kentucky evidently does not place a great deal of emphasis on the promotion of tourism as a means of generating revenue. In 35th place, the state devotes a mere 4.3% of its GDP to encourage tourism within the state. Given the success rates of craft breweries in the top tier of craft brewing states, this statistic does appear to have a great deal of validity when comparing the craft brewing environment at the state-level. Therefore, a lack of emphasis on tourist activities seems to be an overall indicator of the

potential that craft brewing has, serving to explain, in part, why Kentucky has been so unsuccessful in the area of craft brewing.

Lastly, as is the case with Louisiana, Kentucky is located in the South, a region heavily influenced by the conservative Baptist values toward the sale and consumption of alcohol⁷. Furthermore, Kentucky does not have a dichotomy of religions (as does Louisiana) that might permit craft brewing from taking hold in some areas but not others. Therefore, the state as a whole probably suffers in the area of craft brewing because of religious interference in the form of intolerance for alcohol. Intrastate variations in Kentucky exist regarding legislation related to alcoholic beverages. Of the 120 counties in the state, 53 are completely dry, and 37 are partially dry. Even in areas where the (often limited) sale of alcohol is permitted, the complexity of the state-level regulations make it easy to see that alcohol sales within the state clearly are a “hot-button” issue (Kentucky Office of Alcoholic Beverage Control 2007, Kentucky Revised Statutes 242.123, Kentucky Revised Statutes 242.1242 2007). Statute 242.1242 (2007) does provide evidence of the relaxation of alcohol-related restrictions as they relate to potential tourism. The updated law permits places listed on the National Register of Historic Places or National Historic Landmarks (even in dry counties) to hold a local election pertaining to the provision of alcoholic beverages at such locations.

The Hofbrauhaus of Newport in northern Kentucky is the state’s largest producer of craft-brewed beers. More than just a brewery, the facility’s claim to fame is being the first authentic Hofbrauhaus in America. Opened in 2003, the brewery clearly emphasizes

⁷ It is acknowledged that there is a great deal of variation within the Baptist denomination, and the intention is not to pigeonhole all religious groups within the Baptist rubric as being equally conservative. As a general rule, however, Baptists have proven over time to more conservative than many other Christian denominations.

the historical importance of brewing in the German tradition, as evidenced by their detailed timeline of the history of the German Hofbrauhaus. In addition to brewing beer, the brewery also offers traditionally decorated German-style rooms to appeal to visitors. The carefully selected décor is complemented with a view of Newport's waterfront location on the Ohio River, and the Cincinnati skyline is visible in the distance. This brewery is not merely attempting to sell its beer, but is also marketing itself to consumers as a destination to relax, drink traditional German brews, and enjoy the authentic setting.

Because of the Hofbrauhaus's strong emphasis on selling itself as a product of German brewing tradition, it comes as little surprise that the names of all its beers are traditional German beer names, with no inclusion of local references. Rather than using the local environment as its selling point, the Hofbrauhaus in Newport attempts to sell itself as being independent of local influences, and instead focuses on the history of Germany's brewing tradition. Furthermore, the brewery's website carefully outlines all aspects of the brewing process, thus showing how a craft brewery can be successful not by marketing the local area, but instead by marketing the history of a foreign country (<http://www.hofbrauhausnewport.com/about.html>).

Alltech's Lexington Brewing Company provides an excellent example of how a craft brewery can become totally entrenched in the local culture. Everything about the brewery is locally oriented—the beers, the references, and their interactions with the local community. Brewing only three beers, all possess local references. Both Kentucky Ale and Kentucky Light, obviously providing the state reference, also display race horses on their packages, a reference to the most famous horse race in America that takes place in Kentucky. Their other beer, Kentucky Bourbon Barrel Ale, is a product of the rich

bourbon-making tradition that the state is famous for. In the brewing process, actual barrels that were once used to create “the finest Bourbons of Kentucky” are used to create this beer. As a special release, the brewery is also offering a limited number of its Bourbon Barrel Ale that is aged twice as long as the normal product before being bottled into a commemorative ceramic bottle that pays tribute a Hall of Fame horse racer. Keeping with the local tradition, a portion of the profits from the sale of this limited release beer is given to the Don MacBeth Memorial Fund, a fund that assists disabled riders, and Old Friends, a retirement farm for at-risk horses (<http://www.kentuckyale.com/kentuckyale/index.html>) (Figure 3.22).

The famed Kentucky bluegrass is overtly evident in the name of Louisville’s largest producer of craft-brewed beers: The Bluegrass Brewing Company. Situated in the renovated historic district of downtown Louisville, the brewery regularly features five beers, and is complemented with a number of seasonal beers available at various times throughout the year. Because the operation is a brewpub and doesn’t bottle its beers, no locally-referenced names are employed. Consistent with its name, the Bluegrass Brewing Company features weekly bluegrass music from local artists, providing an example of how a craft brewery is able to play off of its name and theme without direct association of their beers to local phenomena.

3.10 Mississippi

Mississippi, of the Deep South, is, by far, the most poorly represented craft brewing state in America. A single brewery in this state of 2,840,000 residents gives it the nation’s lowest ratio of craft breweries per 100,000 residents at the state level: 0.035



Figure 3.22: Images of Alltech's Lexington Brewing Company Logos

Source: www.kentuckyale.com

(Figure 3.23). Several factors serve as explanations of why the state is so far removed from craft brewing.

First, the conservative religious values influence regulations pertaining to alcohol provision. Mississippi is the “driest” state, one of three states in America where, by default, counties are deemed dry. Therefore, at the county level, the local government must specifically authorize the sale of alcoholic beverages in order for it to be considered legal (Mississippi Code Section 67-1-3). More than one-half of the counties in Mississippi remain dry. This fact alone helps to explain the paucity of craft breweries in the state—county level restrictions prevent the formation of a craft brewery (or any other provider of alcoholic beverages) in over half of the counties in the state. The large number of dry counties in the state were reason for The University of Southern Mississippi’s Gamma Theta Upsilon’s Geography Honor Society to create a “Beer Drinker’s Map of Mississippi”, displaying the wet and dry counties of the state. (Figure 3.24).

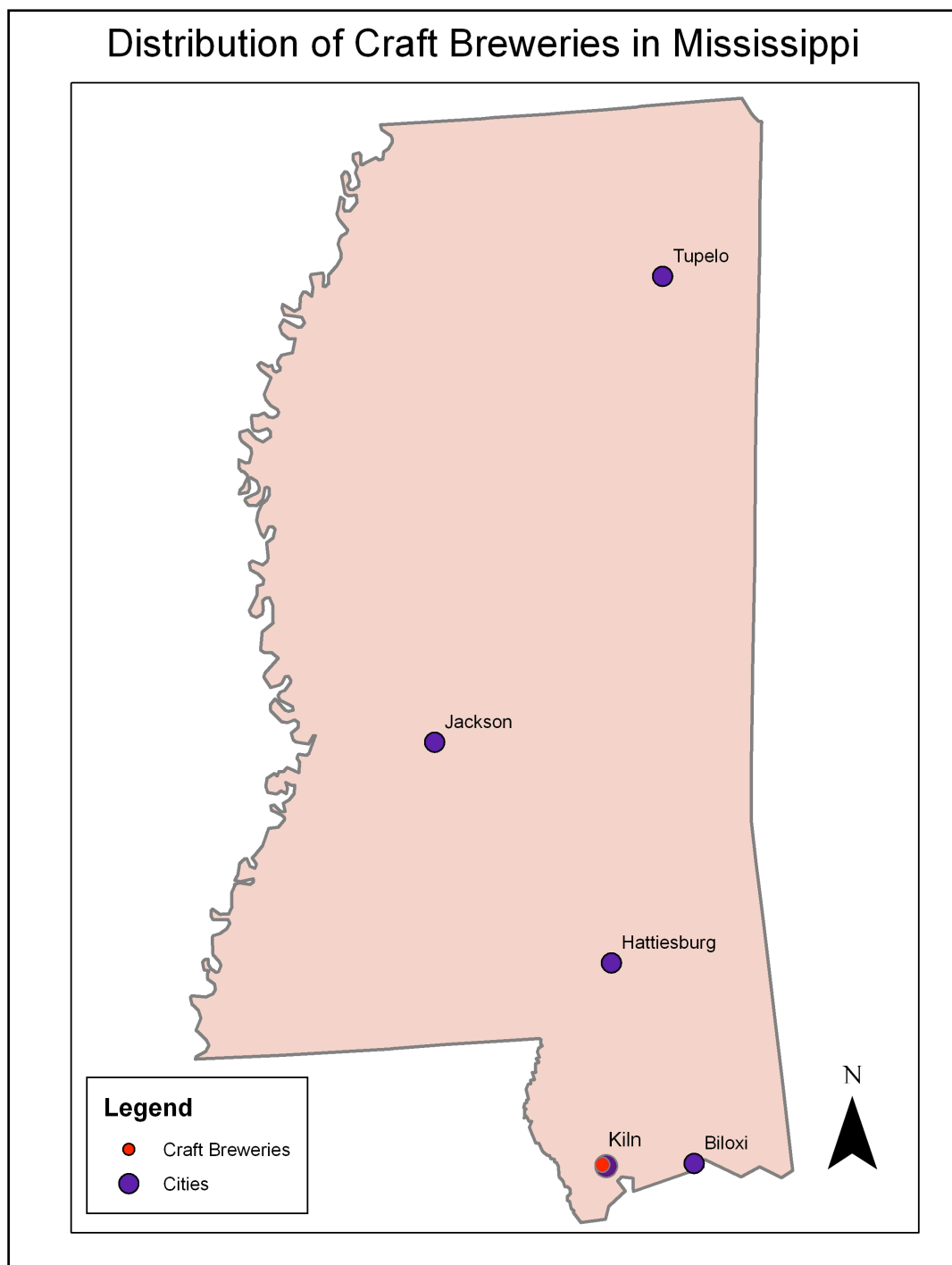


Figure 3.23: Distribution of Craft Breweries in Mississippi

Compounding Mississippi's beer woes stemming from prohibitive alcohol laws is its low median income of \$31,330, making it the second-poorest state in America, only ahead of West Virginia. Even in places where alcohol is permitted, the expensive nature of craft-brewed beers would be out of reach for many resident consumers. The low percentage of highly educated residents in the state serves as an additional indication of why craft brewing has struggled to develop in this southern state. All of the successful craft brewing states have substantially higher rankings in the field of the percentage of a state's residents with at least a bachelor's degree than Mississippi's dire 50th place. It comes as little surprise, then, that a state with such a small portion of its residents obtaining degrees from a university would also be poorly represented in its craft brewing.



Figure 3.24: Image of "Beer Drinker's Map of Mississippi"

Source: <http://www.msbrew.com/2007/11/beer-drinkers-map-of-mississippi-t.html>

One area related to craft brewing where Mississippi does not score so poorly is in its presence of young people. The state ranks 29th in this area, with 13.4% of its residents aged between 25 and 34. While this group is cited for being the largest consumers of craft brewed beer of any age segment of the population, the statistic obviously does not play out to encourage the development of a large number of breweries. While this age range may be the primary consumers of craft beers, it is more likely that a specific segment of this age grouping, young urban professionals (yuppies), are the persons responsible for buying small-batch production beers. Therefore, the statistic is slightly misleading—a percentage of the population falling within the ‘yuppie’ stereotype would probably relate more closely to the degree of craft brewing in a given area than simply the percentage of residents within the 25-34 age cluster..

Among states, Mississippi ranks seventh in the percentage of its gross domestic product that is used to promote tourism within the state. In many other states, a higher-than-average investment in tourism seemed to relate positively to success in craft brewing. This thus indicates that no single factor is sufficient in explaining success or failure in craft brewing at the state level. It is likely that the widespread prohibitions regarding alcohol sales supersede all other factors in the state, therefore preventing the establishment of additional craft breweries despite attempting to draw consumers from outside the state.

The final factor that is most likely related to Mississippi only having one craft brewery is the percentage of black residents within the state. Similar to Louisiana, Mississippi also has approximately three times the national average of black residents (37.1%), the largest percentage of African Americans of any state in America. African

Americans account for a very small percentage of craft beer sales (Beer Industry Update 2002), and the large presence of black residents in the state, therefore, does not bode well for craft brewing in its advanced stages. Again, it isn't necessarily black residents per se that are opposed to the consumption of craft-brewed beers—collinearity likely exists between the lower-than-average income levels of African Americans and the small percentage of craft-brewed beer sales attributed to this segment of the population.

The state of Mississippi is anomalous in its division of metropolitan/non-metropolitan breweries because it is the only state without a single brewery in a metropolitan area. Its sole brewery, Lazy Magnolia, is located in the town of Kiln, outside of any metropolitan area. This probably is not exemplary of the geographic concept of hierarchical diffusion, characterized by a phenomenon first appearing in the largest of cities and then working its way down the urban hierarchy. Given the small population size (one) of Mississippi craft breweries, the location of Lazy Magnolia Brewing Company could not be said to occur as a result of the craft brewing phenomenon diffusing out of the state's largest cities. Instead, it is more likely that the brewery located in this small town for other, extraneous reasons.

Lazy Magnolia Brewing Company, boasting of their exceptionalism as being the only producer of craft-brewed beers in the state of Mississippi, packages all of their beers for sale off of the premises (such as restaurants, distributors, other alcoholic beverage vendors). As the sole provider of craft beers to Mississippi residents, Lazy Magnolia takes advantage of this by closely associating their beers with local connotations. Even the brewery's name, Lazy Magnolia, pays tribute to the magnolia tree, a botanical specimen that is symbolic of Southern beauty. Amberjaque Rye Ale, one of a small

minority of rye ales, provides an historical reference to the pirates (Jaques) of the Gulf Coast, who, “Most certainly looked forward to their retreats at Cat’s Island...where they could wash away the summer heat with a cool summer brew similar to our Amber Rye Ale.” Additionally, the beer makes reference to the Amberjack, a popular food fish found in the coastal waters. Par-3 American Wheat Ale is a light beer whose formula was developed as a more flavorful option to the light pilsners offered by the mass-producers of the brewing industry. According to the brewery’s description of this wheat ale, “This brew is the perfect companion to Mississippi’s favorite outdoor pastimes.”

Included in the descriptions of two of Lazy Magnolia’s seasonal brews featured on the brewery’s website are stories of the local significance related to the creation of the beers. First, Indian Summer Spiced Ale, a refreshing beer with a citrus taste, was scheduled for release in late summer of 2005. Unfortunately, Hurricane Katrina struck, wiping out the power for the brewery. Luckily the beer that was soon to be released survived, and the first batch was distributed in Hattiesburg later in the year. The destruction caused by Katrina was problematic for the brewery, but later served as a means for Lazy Magnolia Brewing Company to relate to the tragedy through their production of beer by including such a story in their description of the beer. Another example of incorporating “the local” into a story related to one of their beers comes in the form of Jefferson Stout, a sweet potato cream stout. The brewery credits local chef Steve D’Angelo, known for his edgy approaches to Gulf Coast cuisine, for influencing the brewery to experiment with non-traditional beer ingredients (eggplant was his first suggestion), thus leading to the inclusion of sweet potatoes in the creation of this stout.

Southern Pecan Ale, the beer that accounts for more than 50% of the brewery's sales, is inherently "Southern" due to its inclusion of pecans. The brewers at Lazy Magnolia claim that, to the best of their knowledge, this is the only beer in the world that uses real pecans in the brewing process. Further, the brewery cites the alkalinity of the local water supply as being a key to the success of this brew, where the basic water is able to draw out the deeper flavors of a darker ingredient such as pecans. The beer came as a result of brewer Mark Henderson's determination to incorporate local flavor into Lazy Magnolia's repertoire. Overcoming the difficulties associated with using nuts in the brewing process, brew master Leslie Marie Hatcher put her chemical engineering degree to work to overcome the problem of creating a beer with too much oil as a result of the inclusion of nuts in the brewing process. Thus, as a result, the distinctly "southern" Southern Pecan Ale was brought on tap at the Lazy Magnolia Brewing Company (Figure 3.25).



Figure 3.25: Image of Lazy Magnolia's Southern Pecan

Source: <http://www.lazymagnolia.com/index.html>

3.11 Evaluating the State-Level Brewing Situation Using Regression Analysis:

Equation One: State-Level Regression

Breweries per 100,000 residents = percentage of residents with bachelor's degree or higher + percent of population 25-34 + median household income + dependence on tourism + state expenditures per capita + percentage of craft breweries in non-metropolitan areas

In order to understand the influences of several cultural factor conditions at the state level, a linear regression equation was developed to assess the strength of several state-specific variables and their relationship to the dependent variable (breweries per 100,000 residents). The independent variables used in this analysis are median household income, percentage of population aged 25-34, the percentage of a state's residents with a bachelor's degree or higher, expenditures on tourism, state expenditures per capita, and the percentage of craft breweries located outside of metropolitan areas. (For a detailed description of the variables 'tourism dependence' and 'state expenditures per capita' from *Cities Ranked and Rated*, see Appendix 2).

The rationale for including the variables of median household income and percentage of population in the 25-34 age range stems from the results of a 2002 *Beer Industry Update* study. This examination revealed important demographic information about purchasers of craft-brewed beer. Consistent with the results of the study, it is first hypothesized that there will be a positive relationship between the dependent variable of 'breweries per 100,000 residents' and median household income, where the overwhelming majority of craft beer was purchased by persons in higher income brackets. As evidenced by the price differential of nearly ten dollars per case of craft beers versus mass-produced products (Tremblay, Tremblay 2005), the higher average

cost of craft beers requires a greater amount of disposable income. Because of the relationship between the purchase of the selected craft beers in the study and consumers within the 25-34 age range, the relationship between the dependent variable and 'percentage of residents 25-34' is hypothesized to be positive, implying that craft breweries will be more successful in states with a larger percentage of residents in this age range.

To consider the effects of variations among states in terms of the degree of education, the percentage of the population with at least a bachelor's degree is taken from the United States' Bureau of the Census. Based on Bourdieu's (1984) notion of distinction that a person's educational upbringing is directly related to their patterns of consumption as a means of social distinction, it is anticipated that there will be a direct relationship between the percentage of residents in each state that has obtained at least a bachelor's degree and the dependent variable. The previous analysis of the nine states appeared to support this assertion, where the states with the greatest ratios of 'craft breweries per 100,000 residents' were also among the top tier of states in terms of the percentage of GDP invested in tourism promotion.

Flack (1997) suggested the role that tourism plays in allowing for the state-level success of craft brewing in Vermont, a state that he cited to be among the top tier of craft-brewing states. For this reason, the percentage of a state's budget that is used to promote tourism will be used as an independent variable. Consistent with his assertion, it is hypothesized that there will be a direct relationship between the percentage of state-level investment in tourism and the dependent variable.

The independent variable of the percentage of craft breweries that is located outside of metropolitan areas is used to signify the degree to which the craft brewery diffusion process has already occurred. I hypothesize that there will be a direct relationship between the ratio of breweries per 100,000 residents and greater percentages of breweries located outside of large urban areas. Trends in popular culture such as the craft brewing phenomenon typically follow a pattern of hierarchical diffusion, as evidenced by the overwhelming percentage of American craft breweries being located within metropolitan areas at the beginning of the diffusion process. Larger potential markets in more populous areas increase the chances of a brewery being successful, and consequently the earliest foundings of craft breweries in a state typically occur in large population centers. Therefore, higher rates of non-metropolitan craft breweries should signify greater success of craft brewing at the state level due to the phenomenon maturing and spreading to less-populated places.

Finally, the variable of 'state expenditures per capita' is used as a proxy for the overall quality of life in a state⁸. Larger government expenditures per resident for basic services are a general indicator of the social welfare of a state. Furthermore, while no direct political information is used per se, this variable can also be used to indicate the political leanings of a state. As a general rule, the states with larger expenditures per capita tend to be more Democratic-leaning, and states that stray away from big government expenditures tend to lean to the right side of the political spectrum. The

⁸ It is acknowledged that disagreement exists over whether or not the quality of life in a state could be measured by how much money is devoted to residents by a state government. For instance, persons who are more right-leaning might argue the opposite to be true. For the sake of this thesis, however, quality of life at the state level is associated with expenditures per capita. Readers who refute my argument can interpret the results in an opposite manner by viewing increased state expenditures per capita as a signifier of negative quality of life.

hypothesized relationship between this variable and the ratio of craft brewery provision is positive, where higher per capita state expenditures (i.e. higher quality of life in a state) will influence greater ratios of breweries per 100,000 residents in a state. (See Table 3.6 for a summary of the hypothesized relationships).

3.12 State-Level Regression Analysis Results:

The independent variables utilized in the state-level regression equation exerted a considerable amount of influence over the dependent variable in the model, indicating relationships of varying degrees among the cultural attributes of respective states (Table 3.7). The F-value of 7.307 indicates that the model as a whole does possess some validity, although not all of the hypothesized relationships in the model held true, nor did the strength of several relationships yield a clear pattern between the provision of craft breweries and several variables used in the model. The three variables that did hold the hypothesized relationships were the percentage of a state's residents with at least a bachelor's degree, the per capita state expenditures, and the percentage of a state's breweries located in non-metropolitan areas.

Bourdieu's (1984) notion of the role of education in influencing consumption as a medium of social distinction produced the clear positive relationship that was expected. The t-value of 'percentage of residents with a bachelor's degree or higher' of 2.801 indicates that a strong relationship is present between the dependent variable and the percentage of residents within a state that have obtained a degree from a university. Based on this model, the percentage of residents within a state that have obtained a degree from a university (at least a bachelor's degree) serves as an adequate predictor of

Table 3.6: Summary of Hypothesized Relationships Between Independent Variables and Dependent Variable of 'Breweries per 100,000 Residents' at State Level

Independent Variable	Hypothesized Relationship	Independent Variable	Hypothesized Relationship
1). Percentage of population with at least bachelor's degree	Positive	4). Expenditure on Tourism	Positive
2). Percentage of residents in age cluster 25-34	Positive	5). State expenditures per capita	Positive
3). Median Household Income	Positive	6). Percentage of breweries in non-metropolitan areas	Positive

Table 3.7: Influences of Independent Variables on Dependent Variable in State-Level Regression Model

Variable	Type	Beta value	t-value	Sig.
Breweries per 100,000 residents	Dependent	n/a	.412	.682
Percentage with bachelor's degree or higher	Independent	0.597	2.801	.008
Percentage 25-34	Independent	-0.125	-0.936	.354
Median Household Income	Independent	-0.371	-1.560	.126
Tourism Dependence	Independent	.098	0.824	.414
State expenditures per capita	Independent	.297	2.295	.027
Percentage of breweries in non-metropolitan areas	Independent	0.441	3.533	.001

R-Square = .505, F-Value = 7.307, Sig. = .000, n= 51

how well-developed a state's craft brewing environment will be. States with higher ratios of craft breweries per 100,000 residents also, as a general rule, possess more educated residents, while those states with lower ratios of breweries per 100,000 residents also tend to have a smaller percentage of residents with advanced degrees.

The proxy variable of hierarchical diffusion, the percentage of a particular state's breweries located outside of metropolitan areas, was the greatest predictor of the dependent variable, with a t-value of 3.533. This indicates that those states that are able to foster craft breweries in areas without large populations tend to be better suited overall in their craft brewing environments. The leading three states, Vermont, Maine, and Montana, support this assertion, as they are also among the top states in terms of higher percentages of craft breweries operating outside of metropolitan areas. It is likely that tourism plays a key role in this, where such breweries without large threshold populations are able to succeed from outside consumers as well as the local populace. Conversely, the actual statistic 'tourism dependence' did not yield a statistically significant relationship (t-value = 0.824), suggesting that simply promoting tourism within a state does not amount to a greater number of craft breweries. Based on the marketing techniques evaluated in the previous section of individual states, it seems as if a specific segment within the larger tourist class (i.e. outdoor recreational enthusiasts) are more likely to patronize craft breweries than are other types of tourists. Furthermore, in some cases, place marketing through state tourism-related expenditures probably do not equate precisely with the overall volume of tourists to an area. As was indicated earlier, an indirect form of place marketing such as the film *A River Runs Through It* would not show up in the tourism-related expenditures, yet this film helped to put the rivers of

Montana on the map, and it is now a bastion of fly fishing tourism. As proof of the indirect effects that this had on craft brewing, the marketing strategies of several Montana craft breweries clearly attempt to capture this sub-segment of the tourists in the area.

The independent variable ‘per capita state expenditures’, used as a proxy measure of the overall quality of life within a state, was the third and final variable used in the model that produced a statistically significant relationship. The t-value of 2.295 indicated a strong relationship between states’ respective craft brewing environments and the social welfare of the state. Given that, for the most part, those states which spend greater amounts per capita for the implementation of social services tend to be more left-leaning states, this could indicate that a more liberal state’s residents are more likely to support a locally-oriented business such as a craft brewery. Furthermore, this statistic is unaffected by any issues of scale due to the manner of the calculation—the statistic is statewide, so no intrastate variations exist.

In the analysis of individual states, several examples were presented related to the percentage of the population within the 25-34 age cluster that seemed to be counter to the reality of this group being the largest consumers of craft beers. For example, successful states such as Montana and Maine have among the lowest percentages of their respective populations in this age range, while the states of Louisiana, Mississippi, and Kentucky (the worst states in terms of craft brewery provision) all possess higher-than-average percentages of their populations within the 25-34 age range. Therefore, it comes as little surprise that the ‘percentage of residents in 25-34 age cluster’ did not yield a statistically significant relationship. The t-value of -0.936 indicates that no relationship exists between the success of craft brewing at the state level and the percentage of a state’s

residents falling within this age range. This is likely the result of a scale issue, where intrastate variations mask any meaningful relationship between the dependent variable and this statistic. This also could be the product of a collinearity issue, where poverty and the percentage of young adults (25-34 age cohort) are conflated. For example, states such as Mississippi and Louisiana both have higher-than-average percentages of their populations within this age cluster, yet still score miserably in their ratios of ‘breweries per 100,000 residents’. At the other end of the spectrum, the most successful three states are far below the average in terms of their percentages of residents within this age cluster, indicating that evaluating this age cluster at the state-level serves no meaningful relationship. It is likely that a clearer pattern will emerge when the scale homes in on a more fine-grained scale by looking at metropolitan areas.

One of the most surprising results of the model was the lack of a strong positive relationship between the median household income and the dependent variable. Given the expensive nature of craft-brewed beers, it would seem likely that those states with greater average income levels would also be the states with a greater ratio of craft breweries. Although this did not yield the positive relationship at this scale of analysis, it is likely that there is a relationship between income level and craft breweries, but the correlation was masked by huge intrastate variations (i.e. a scale issue). Additionally, in states where craft breweries are keying in on tourists, local income statistics would be irrelevant. This seems to be the case with the top three craft brewing states, where Vermont, Maine, and Montana did not rank near the top in median household incomes among states, yet ranked very highly in terms of the ratio of ‘craft breweries per 100,000 residents’.

CHAPTER 4: METROPOLITAN-LEVEL CRAFT BREWING

4.1 Urban Brewing: Analyzing Craft Brewing at the Metropolitan Level

The previous analysis of craft brewing at the state level revealed the importance of alcohol regulations to craft brewing development. State-specific alcohol regulations helped to explain, for example, why some states are so poorly suited for craft brewing. The relationship between the extent of a state's emphasis on tourism and the degree of success in craft brewing also became apparent throughout the state-level analysis. The three top-tier craft brewing states (Vermont, Maine, and Montana, respectively) also ranked near the top in the percentage of each state's GDP invested in the promotion of tourism, while the states that have experienced limited success in craft brewing have not been as active in promoting tourism at the state level. Many of the variables evaluated, however, when aggregated to the state level, mask much of the variation present within a state. For instance, despite the Beer Industry Update (2002) study citing the 25-34 age cluster as being the leading consumers of selected craft-brewed beers, the state-level analysis appeared to greatly distort the relationship between the percentage of a state's relationship falling in this age group and the ratio of craft breweries per 100,000 residents.

Shifting the scale to home in on metropolitan areas should, therefore, help to paint a clearer picture of factors affecting the development of craft breweries. Furthermore, an evaluation of craft brewing at the metropolitan level is of great importance in understanding the craft brewing phenomenon because the large majority of craft brewing facilities are located in metropolitan statistical areas (MSAs).

In order to account for population differences among metropolitan areas, a ratio of ‘craft breweries per 100,000 residents’ was calculated⁹. To determine the strength of the relationships between the dependent variable of ‘craft breweries per 100,000 residents’ and the many factor conditions present at the metropolitan level, regression analysis will be utilized. The analysis should pinpoint which factors are the most influential in fostering as well as deterring the development of craft breweries.

First, a simple linear regression will be employed and analyzed using all variables from their respective sources, followed by three models that include only the variables from each of their respective sources. The employment of these three equations (equations 2, 3, and 4) with variables only from these individual sources (*Cities Ranked and Rates*, *The United States Bureau of the Census*, and *The Rise of the Creative Class*) will provide a clear picture of the influences that the variables from each source have on the independent variable, independent of any overlapping influences from the other sources. For example, unlike equation 1 that uses all independent variables from all three sources, the second regression equation, using only those variables drawn from *Cities Ranked and Rated*, will be able to more clearly show the extent of influence of these independent variables, independent of the degree of influence that the variables from *The United States Bureau of the Census* and *The Rise of the Creative Class*.

⁹ While population obviously does play a role in determining the number of craft breweries present in a metropolitan area (i.e. metropolitan areas with larger populations, on average, are more likely to have a larger number of craft breweries), it is not population alone that determines the extent of craft brewing in an MSA. In a Ordinary Least Squares (OLS) regression model without accounting for population in the dependent variable by simply using the number of craft breweries present in an MSA, population explained only slightly more than one half of the variance present among metropolitan craft brewing environs. It is therefore necessary to look beyond population and home in on various other factors in an attempt to pinpoint what the necessary factors are for craft breweries to flourish at the metropolitan level.

The final exercise with regression analysis will utilize the stepwise regression procedure. Stepwise procedures will help to minimize collinearity, in which one or more of the independent variables that essentially measure the same phenomenon are eliminated from the equation because they do not contribute to a statistically significant degree to an explanation of variation in the dependent variable. The respective models generated using the SPSS statistical package will be analyzed. Finally, based on the model that possesses the greatest amount of predictive power (i.e. the highest R-square value), the largest outliers from the regression model will be analyzed. A careful probing of those metropolitan areas that do not conform neatly to the best-fitting model may provide information as to why a particular metropolitan area cannot be adequately predicted. For example, why might a metropolitan area such as Portland, Oregon, the MSA with the greatest number of craft breweries, be able to foster so many locally-oriented breweries? Conversely, why might the city of Houston, Texas and the surrounding areas only possess two craft breweries despite having such a huge population?

4.2 Metropolitan-Level Variables: Definitions and Hypotheses

The independent variables used in the regression analysis come from three major sources: *Cities Ranked and Rated*, data collected from the *United States Bureau of the Census*, and *The Rise of the Creative Class* (Florida 2002). All variables in the regression analysis are used to compare various phenomena among metropolitan areas. The expectation is to develop a predictive model of the strength (or weakness) of an MSA's craft brewing environment. The first regression equation will employ all

variables, while subsequent models (via the stepwise procedure) will selectively determine which variables will be included in the models based on the strength of relationships, thus minimizing the degree of collinearity among the independent variables used in the equation. Appendix 2 presents a detailed description of the variables drawn from *Cities Ranked and Rated* and *The Rise of the Creative Class*, as well as the manner in which they were calculated.

The first variable utilized from the *United States Bureau of the Census* is ‘median household income’, a measure of the average income level of households in each respective metropolitan area. It is hypothesized that a positive relationship will exist between this independent variable and the dependent variable of ‘craft breweries per 100,000 residents’. The more expensive nature of craft-brewed beers requires the presence of a greater amount of disposable income. Therefore, metropolitan areas that are wealthier should be, on average, expected to support a greater number of craft breweries than metropolitan areas with lower median household income values. Furthermore, the results of a previous study (*Beer Industry Update* 2002) clearly cite persons in higher income brackets as purchasing craft-brewed beers with the greatest frequency.

The variable ‘percentage of residents 25-34’ is used as an alternative to the more common Census statistic ‘median age’ in an effort to more clearly define the specific age segment that is ostensibly responsible for purchasing the greatest quantities of craft beers. Simply using the ‘median age’ value could potentially distort the age-related statistic due to large intra-metropolitan variability. A *Beer Industry Update* (2002) study cited this age group as being the primary consumers of the craft beers used in their evaluation of

beer consumption in America¹⁰. Therefore, it is hypothesized that a positive relationship will exist between this independent variable and the dependent variable, where greater percentages of this age cluster should be directly associated with a greater ratio of ‘craft breweries per 100,000’ residents.

The final variable extracted from the *United States Bureau of the Census*’ 2000 population census is ‘percentage of residents with a bachelor’s degree or higher’. This variable measures the extent to which a metropolitan area possesses an educated populace. The hypothesis for this relationship holds that a greater percentage of highly educated individuals will yield a positive relationship with the independent variable. The rationale for this assertion stems from Bourdieu’s (1984) argument that consumption patterns can be used as means of social distinction. The much higher-than-average prices of craft-brewed beers compared to the mainstream, generalist beers (Miller, Budweiser, and Coors, for example) make the smaller production beers distinguishable from the large production beers. Therefore, consuming craft beers could be viewed as a highbrow alternative to the homogenous tastes of American-style lagers, setting this type of beer drinker apart from the “average” American beer consumer. Bourdieu cites one of the key motivators of this type of consumption is rooted in the educational attainment of the individual, where more educated persons are more prone to engage in uniquely identifiable patterns of consumption in an effort to distinguish themselves from the

¹⁰ It is important to note that the results of the study showed that the 25-34 age cohort had the greatest propensity to consume the craft beers included in the study, but not craft beers as a whole. The two beers used in the study that are, by definition, craft beers, were Samuel Adams Boston Lager and Sierra Nevada Pale Ale due to their universal accessibility (i.e. they are distributed and sold throughout the country). The reader should, therefore, be conscious not to equate these two craft beers included in the study with craft-brewed beers as a whole.

“average” person.¹¹ Based on this theoretical construct, it is anticipated that metropolitan areas with a higher percentage of persons with at least a four-year degree should be more likely to consume craft beers than metropolitan areas with smaller percentages of highly educated residents.

The next group of variables is taken from *Cities Ranked and Rated*, an almanac that evaluates a myriad of conditions at the metropolitan level. All ten of these variables are calculated as ratios ranging from 0 to 100, with 100 being the highest possible score. The first variable employed from this index is ‘economy and jobs’. Based on the assumption that a more flourishing economy will lead to a greater amount of consumer spending in an area, it is hypothesized that a positive relationship will be established between the dependent variable and ‘economy and jobs’. It is likely that metropolitan areas with lower scores will not possess nearly as high a ratio of ‘craft breweries per 100,000 residents’ due to poor economic conditions preventing the purchase of more expensive beers.

The next metropolitan attribute represented in the model is ‘transportation’, which serves as a measure of how well a particular city and surrounding area’s transportation network is developed. Although not directly related to craft brewing, this variable serves as one indicator of the attractiveness of a place. Given that a better established transportation network and a greater number of transport options would make a particular

¹¹ It is probable that there is a high degree of snobbery within the niche market of craft-brewed beer drinkers, leading to high-brow consumers attempting to differentiate themselves from other craft beer drinkers by consuming only the best of what the craft beer market has to offer (i.e. Samuel Adams Utopia beers that range from \$120.00 to \$160.00 per bottle). For the purpose of this analysis, however, consuming craft-brewed beers in an attempt at social distinction implies the differentiation of craft beers versus the generalist, mega-producers’ beers, where consumers distinguish themselves by not “stooping to the lowly level of American-style lagers” and instead purchase the smaller batch craft beers.

metropolitan area more attractive than others based on increased accessibility and ease of mobility, it is hypothesized that a positive relationship will exist between this variable and the dependent variable.

Climate is another example of a measure of the attractiveness of a place and overall quality of life. It would seem likely that metropolitan areas with more favorable climates would therefore be more “happening” places, and would be more likely to have well-developed craft brewing environments¹². Furthermore, the state-level portion of the craft brewing analysis revealed that, to varying degrees, annual weather patterns do play a role in how craft-brewed beers are marketed to consumers. Therefore, it is hypothesized that a direct relationship will exist between how favorable a metropolitan area’s climate is and the dependent variable, indicating that those metropolitan areas with more appealing, tolerable climates will be more likely to have a greater ratio of craft breweries to population.

Crime rates are another factor that should be considered when evaluating the overall quality of a city and its surrounding areas. Assuming that craft brewing is more likely to develop in more attractive, safer places, it is hypothesized that that a positive relationship will also exist between this independent variable and the dependent variable (based on the scoring system, areas with lower crime-related statistics receive scores closer to 100, while the metropolitan areas with higher crime rates are given scores closer to zero). Areas that are safer than others should be more likely to have a greater number of craft breweries. Given the frequent locational decisions of craft brewers to open their

¹² Measures of climate tend to favor more moderate climates in their scoring systems. For a detailed description of the factors incorporated into a metropolitan area’s climate score, see Appendix 2.

production facilities in central locations (i.e. restored downtown factories), patronage to downtown breweries would be more likely to occur in cities where the fear of crime (rational or irrational) was lower. For example, a city such as Detroit, with its reputation for being a crime-ridden urban area, should be less likely to have craft breweries than a city such as Danbury, Connecticut, the city that scores the highest in the crime statistic, indicating a relative paucity of crime in the city.

Returning to Bourdieu's belief that the consumption of goods and services that are seen as "high brow" stems from influences such as childhood upbringing and level of educational attainment, the provision of arts and cultural activities should serve as an indicator of how well-developed is a particular metropolitan area's craft brewing environment. Local demand conditions influence the degree to which an urban attribute such as 'arts and culture' is developed, and, assuming that the provision of a greater number of arts and cultural activities exists in a metropolitan area, so, too, should there be a greater ratio of 'craft breweries per 100,000 residents'. The overlap between an appreciation of 'arts and culture' and the consumption of a higher status product such as craft-brewed beers fits soundly into Bourdieu's framework. Therefore, it is hypothesized that a positive relationship will be present between the 'arts and culture' independent variable and the ratio of 'craft breweries per 100,000 residents' at the metropolitan level, suggesting that metropolitan areas with better established arts and culture scenes will also be better established in their craft brewing. .

The 'quality of life' variable is an aggregate scoring of each metropolitan area based on three components: physical attractiveness of place, heritage via cultural and physical preservation, and the overall ease of living. As was shown in the state-level

chapter, craft breweries frequently locate in historic districts, renovating and recycling old buildings such as churches, factories, firehouses, and often incorporating the history of a building into the theme of the brewery. This reuse of old buildings and acknowledgment of the structures' past uses ties in neatly with the physical attractiveness of place, as well as both cultural and physical preservation. This leads to the hypothesis that metropolitan areas that are deemed to have a higher quality of life should also have a greater ratio of 'craft breweries per 100,000 residents' at the metropolitan level, indicating a positive relationship between this quality of life index and the dependent variable.

Next, the 'health and healthcare' score for each metropolitan area is included in the calculation as another measure of the attractiveness of a place. Greater scoring in this field comes as a result of better available healthcare services (i.e. better doctor-to-patient ratios) as well as the attractiveness of a place in regard to health-related environmental factors (natural hazard risks, air quality scores, etc.). Consistent with the hypothesis that, generally speaking, a more attractive metropolitan area should possess a greater number of craft breweries when population is accounted for, it is hypothesized that there will be a direct relationship between the 'health and healthcare' scores and the dependent variable. Metropolitan areas with a greater emphasis on the provision of healthcare services as well as a paucity of negative health-related factors should too possess a greater ratio of craft breweries when adjusted to population.

Amenities such as the availability of leisure-related activities are becoming an increasingly important consideration by individuals in their decisions of where to reside. Evidence of this exists when looking at the amenity-driven decisions of high-tech firms

to relocate to high-amenity areas such as the Boise, Idaho area, a location that offers many leisure, outdoor activities because of its location in the Mountain West. Furthermore, in the state-level analysis, many examples were presented related to the marketing techniques of craft brewers in associating their beers with outdoor activities (i.e. hiking, mountains, rafting, fly fishing). It would seem likely, therefore, that areas with higher scores in the leisure index would be locations that are better suited to have a greater number of craft breweries, hence the hypothesized relationship between this independent variable and the dependent variable. Metropolitan areas that are able to provide a larger number and wider variety of leisure activities should also be more likely to have a greater number of craft breweries.

The percentage of residents with at least a bachelor's degree takes into account only the portion of citizens within a metropolitan area who possess an advanced degree, but does not necessarily measure the emphasis that is placed on education. The role of job-related migration could greatly distort these two different education-related measures, where an influx of highly educated residents to an area would not necessarily coincide with the emphasis given to education in the same area. For example, Washington, D.C. has the greatest percentage of educated residents of any city in America, but much of this is a result of work-related moves, and is not necessarily a by-product of the local educational system. The inclusion of the 'education' variable, therefore, attempts to fulfill the role of measuring the varying degrees to which metropolitan areas value education through the provision of educational services (i.e. schools, universities), the quality of schools, as well as the educational achievement levels of residents (which does not focus solely on completion of a four-year university degree, but also includes high

school and two-year degrees). I hypothesize that a higher score in the ‘education’ scoring should equate positively with a greater ratio of ‘craft breweries per 100,000 residents’, indicating that metropolitan areas that emphasize education to a greater degree should be better established in their craft brewing environments.

The final variable employed from *Cities Ranked and Rated* is ‘cost of living’. Unlike all other variables used from this almanac, the relationship of this independent variable to the dependent variable is hypothesized to be negative. The ‘cost of living’ scores for metropolitan areas are lower for those areas that are more expensive, while more affordable areas are given scores closer to 100. While a cheaper area might serve as an incentive for some Americans to locate to an area, higher-cost areas (those with lower scores in the index, such as New York, Boulder, San Francisco) have become more expensive areas to live due to demand-driven markets, indicating the strong pull factors that must be present in order for demand to remain high. Therefore, metropolitan areas such as these are more likely to be viewed as “happening” places, and would be more likely to have a greater number of craft breweries when population is accounted for.

The last group of variables to be employed in the regression modeling comes from Florida’s (2002) *The Rise of the Creative Class*, an analysis of metropolitan areas based on his thesis that urban areas that possess greater proportions of creative-minded workers are those areas which are more likely to be successful in the present (and future) economic system. All five of the variables taken from the Florida text are ordinal, where

the better suited metropolitan areas based on the indices used have scores closer to one, and those ranking poorly have numerical scores closer to 276¹³.

‘Creativity Rank’ is a measure of how the creative nature of workers in a metropolitan area stack up against the national average, gauged by statistics such as the number of patented innovations produced in an MSA. The relationship with this ranked-order variable and the dependent variable is hypothesized to be negative, where those metropolitan areas displaying greater amounts of creativity should be equated with a greater number of craft breweries. In addition to areas scoring highly in this area being better off economically, the creative nature of the workforce should coincide with the creative nature of craft brewing, where an imaginative populace should be more likely to appreciate the artistic, inventive nature of craft-brewed beers than would areas without a large creative core segment of the metropolitan population.

The ‘Tolerance Rank’ gauges how accepting an MSA’s population is in accepting and embracing lifestyle preferences that are counter to norms in American culture, such as cultural diversity and homosexuality. When craft-brewed beers are compared to the traditionally bland mainstream brews, a great amount of tolerance and acceptance of beer beyond the context of what has become the norm of beer (mass-produced, American-style lagers) is required if the unique, sometimes off-the-wall concoctions created by craft brewers are to succeed at the local level. A lower ranking (higher level of tolerance) in the tolerance index at the metropolitan level should, therefore, be equated with a greater

¹³ The discrepancy between the 276 metropolitan areas from the Florida text and the 331 metropolitan areas from *Cities Ranked and Rated* comes as a result of the manner of classification. *Cities Ranked and Rated* views component Primary Metropolitan Statistical Areas (PMSAs) as being separate from the larger Consolidated Metropolitan Statistical Area (CMSA). *The Rise of the Creative Class*, on the other hand, focuses solely on the larger CMSAs, not treating the PMSAs individually, which thus accounts for the discrepancy in numbers.

ratio of craft breweries per 100,000 residents, hence the hypothesized negative relationship between this independent variable and the dependent variable. Areas that rank closer to the top of the list (closer to one) in the tolerance index should yield a greater number of craft breweries.

The ‘technology rank’ is a ranked ordering of metropolitan areas based on how much of the area’s economic output is a result of high-tech production. Production in the United States has shifted away from low-skilled, low value-added methods of production to high value manufacture of technologically related goods, and Florida argues that areas that are better adapted to this new style of production are better off economically. If this is true, then the existence of a larger number of craft breweries in more high-tech metropolitan areas should occur due to an overall more prosperous economy at the metropolitan level, hence the hypothesized negative relationship between ‘technology rank’ and the dependent variable. The famed Silicon Valley and its production of high-tech products and ideas should equate to a larger number of craft breweries within the San Jose MSA, just as a technological backwater such as Youngstown, Ohio should be less likely to have a large number of craft breweries when the effects of population are taken into account.

‘Wage inequality rank’ is the only independent variable considered in this analysis with no hypothesized relationship to the dependent variable. Like the other variables used from the Florida text, this is also the output of the ranked ordering of metropolitan areas based on the disparity between the highest and lowest incomes within an MSA. The ranking system gives those metropolitan areas lower ranks (closer to one) which have a lower degree of inequality in wages, and the metropolitan areas that exhibit

a higher degree of wage inequality are given larger numbers (closer to 331). Therefore, a negative relationship to the dependent variable would indicate, that as a general rule, the metropolitan areas with a lower degree of wage inequality are areas with a greater number of craft breweries. A positive relationship would indicate that, when population is accounted for, craft breweries occur in greater numbers in metropolitan areas with a larger economic divide.

Finally, the ‘talent rank’ orders metropolitan areas based on the level of talent possessed by members of the workforce within a particular MSA. Locations with more highly-skilled workers receive rankings closer to one, and higher ranks indicate that a lower percentage of highly skilled workers reside in a metropolitan area. It is hypothesized that the ‘talent rank’ independent variable will yield a negative relationship to the dependent variable, indicating that areas that possess a greater percentage of highly skilled workers will be those with a greater number of craft breweries when the effects of population are accounted for. This hypothesis can be justified on two grounds. First, referring back to Bourdieu’s (1984) argument that patterns of consumption are, in part, the result of one’s educational background, where more highly educated persons are driven to purchase more expensive products in an attempt to distinguish themselves. As a general rule, one’s talents and abilities as workers come as a result of varying levels of educational training, thus indicating that more talented workers will also be more educated workers. The other justification of this hypothesis is rooted in economics. Persons who are considered to be more talented are more likely to receive higher salaries, thus providing a greater amount of disposable income that could be spent on a higher-end

product such as craft-brewed beer. Therefore, areas that are deemed to be more talented should be equated with a larger number of craft breweries to serve the local populace. (For a summary of the variables and their hypothesized relationships, please see Table 4.1).

4.3 Simple Linear Regression Using All Variables

Equation 1: Simple Linear Regression Utilizing All Variables:

Craft breweries per 100,000 residents = median household income + percentage of residents with at least bachelor's degree + percentage of residents 25-34 + climate + transportation + economy and jobs + crime + arts and culture + quality of life + health and healthcare + leisure + education + cost of living + wage inequality rank + technology rank + talent rank + tolerance rank + creativity rank

The first equation is an Ordinary Least Squares (OLS) regression using all variables from the United States Bureau of the Census, *Cities Ranked and Rated*, and *The Rise of the Creative Class*. It is expected that a high degree of collinearity will potentially exist especially among the three tangentially related measures related to education, as well as the independent variables that serve as measures of the economic situation at the metropolitan level. Putting all variables into the model will, however, display which variables are likely unaffected by others, and therefore have a greater degree of a relationship with the dependent variable. Furthermore, it will be important to see how these seemingly related measures interact with one another, and which indices are better predictors of how well developed a metropolitan area's craft brewing environment will be.

Table 4.1: Hypothesized Relationships of Independent Variables to Dependent Variable

Variable	Source	Hypothesized Relationship
Median Household Income	US Bureau of the Census	Positive
Pct. With Bachelor's Degree or Higher	US Bureau of the Census	Positive
Pct. in 25-34 Age Cluster	US Bureau of the Census	Positive
Climate	<i>Cities Ranked and Rated</i>	Positive
Transportation	<i>Cities Ranked and Rated</i>	Positive
Economy and Jobs	<i>Cities Ranked and Rated</i>	Positive
Crime	<i>Cities Ranked and Rated</i>	Positive
Arts and Culture	<i>Cities Ranked and Rated</i>	Positive
Quality of Life	<i>Cities Ranked and Rated</i>	Positive
Health and Healthcare	<i>Cities Ranked and Rated</i>	Positive
Leisure	<i>Cities Ranked and Rated</i>	Positive
Education	<i>Cities Ranked and Rated</i>	Positive
Cost of Living	<i>Cities Ranked and Rated</i>	Negative
Wage Inequality Rank	<i>The Rise of the Creative Class</i>	?????
Technology Rank	<i>The Rise of the Creative Class</i>	Negative
Talent Rank	<i>The Rise of the Creative Class</i>	Negative
Tolerance Rank	<i>The Rise of the Creative Class</i>	Negative
Creativity Rank	<i>The Rise of the Creative Class</i>	Negative

4.4 Analyzing the Results of Regression Equation One

Of the three variables included in the equation from the Census, two achieved statistical significance (Table 4.2). The hypothesized positive relationship was confirmed between the dependent variable and the percentage of residents in a metropolitan area that have achieved at least a four year degree from a university ($t\text{-value} = 2.618$), indicating that an MSA with a greater proportion of educated residents is more likely to have a greater number of craft breweries when the effects of population are accounted for. Despite the results of the 2002 study indicating the overwhelming importance of the 25-34 age segment in purchasing craft-brewed beers, this metropolitan-level model did not support this assertion at all, with the $t\text{-value}$ indicating that virtually no relationship exists. This could be due to the limited sample size of craft-brewed beers included in the study. Both craft brews included in the study, Sierra Nevada and Samuel Adams, transcend metropolitan boundaries, and are distributed in most places throughout the country, thus making them likely candidates for inclusion in a nationwide study. This could indicate that while the 25-34 age group is, in fact, the age demographic purchasing the majority of these two brews, their consumption habits do not equate to the patronage of more locally oriented craft breweries, which frequently require on-site purchase and (sometimes) consumption of beers. The final variable of Census origin, 'median household income', did not adhere to the hypothesized relationship. Shockingly, despite the much greater average costs of craft beers versus their mainstream counterparts, 'median household income' yielded a negative relationship with the dependent variable ($t = -3.667$), implying that metropolitan areas with relatively higher average income levels do not equate with a greater amount of craft breweries, but those MSAs with lower-than-

Table 4.2: Results of Regression Equation One (All Variables)

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.163	.460		2.528	.012
Transportation	.002	.001	.072	1.298	.195
Cost of Living	-.007	.002	-.246	-3.112	.002
Health/Healthcare	.002	.002	.074	1.139	.255
Crime	.002	.002	.090	1.610	.108
Creativity Rank	.002	.003	.240	.864	.388
Technology Rank	-4.503E-5	.001	-.005	-.037	.971
Talent Rank	.000	.001	-.029	-.208	.836
Tolerance Rank	-.002	.001	-.259	-1.792	.074
Wage Inequality Rank	.001	.001	.081	1.081	.280
Percent with Bachelor's or Higher	3.456	1.320	.287	2.618	.009
Percentage 25-34	.008	.038	.010	.208	.835
Climate	.000	.002	-.017	-.289	.773
Economy and Jobs	.000	.001	-.007	-.137	.891
Arts and Culture	-.007	.002	-.267	-4.387	.000
Leisure	.001	.002	.055	.677	.499
Education	.004	.002	.139	1.554	.121
Quality of Life	.004	.002	.147	2.256	.025
Median HH Income	-3.221E-5	.000	-.324	-3.667	.000

R-Square = .332, F-value = 8.587, Sig. = .000, n=331

average household incomes are more likely to have a larger number of craft breweries. This surprising relationship may not be as clear cut as the equation implies, however. First, even though the ‘median’ statistic is the least affected by outliers among the three measures of central tendency, it still is possible that intra-metropolitan variability masks the potentially large variations of income levels. Secondly, the role of tourism and consumption of craft beers from people outside of the region could help to explain this ostensibly odd relationship, where visitors to craft breweries from other areas could help to sustain the success of craft breweries.

The next group of variables, taken from *Cities Ranked and Rated*, yielded three statistically significant relationships, two that confirmed their hypothesized relationships, and one that was counter to it. The strongest relationship exerted among any of the independent variables was that of ‘arts and culture’, but, surprisingly, the relationship was in the opposite direction of what was expected. The t-value of this independent variable of -4.387 suggests that metropolitan areas without well-developed art scenes and a dearth of cultural activities available are actually, on average, likely to have a greater number of craft breweries. Given the large amount of creativity that is associated with craft brewing (nontraditional ingredients, off-the-wall combinations, etc.), it would seem that persons with an appreciation for the arts as well as cultural activities would also tend to favor artistic creations in their selection of beers, but the model suggests that the opposite is true.¹⁴

¹⁴ The manner in which the ‘arts and culture’ value is calculated in *Cities Ranked and Rated* is indicative of the negative relationship present here. The almanac’s mode of simply counting the number of institutions present in an MSA may not be adequate in painting a picture of the arts and culture scene present. Further, this method of scoring tends to greatly favor larger MSAs, and, given that it has been statistically proven

I made the assumption that MSAs with stronger pull factors would have increased demand to reside in such areas, leading to higher costs of living. Therefore, higher costs of living could serve as a general measure of how happening a metropolitan is, and I hypothesized that more happening places would be those with a greater number of craft breweries. The method of scoring this index in *Cities Ranked and Rated* was to give more expensive MSAs scores closer to zero, and areas that are cheaper to reside in received scores closer to 100, leading to the hypothesized inverse relationship. The statistically significant t-value of -3.112 confirmed the notion that the more expensive the cost of living in metropolitan areas is, the more likely an MSA is to have a greater number of craft breweries.

The final variable from *Cities Ranked and Rated* that achieved statistical significance was ‘quality of life’. The t-value of 2.256 adhered to the hypothesized relationship that metropolitan areas with a higher quality of life would be more likely to have a greater number of craft breweries. Based on the method of evaluation of metropolitan areas for the scoring of this index, MSAs with a greater ease of living, as well as an appreciation for and desire to preserve physical and cultural history, were, on average, equated with a greater number of craft breweries when the effects of population are taken into consideration.

‘Education’ followed the direction of the hypothesized relationship, but not to a statistically significant level. It is likely that the other education-related measures overlapped, thereby limiting the effects of this variable, along with the two other related

that instances of craft brewing are not simply a function of population, the validity of this index is limited for the purpose of this analysis.

measures of this metropolitan attribute (talent rank and percentage of residents with at least a bachelor's degree). The other variables from this almanac that trended in the direction of their hypothesized relationships are 'transportation', 'health and healthcare', 'crime' and 'leisure', while 'climate' and 'economy and jobs' trended slightly in the negative direction. None of these six variables influenced the dependent variable to a statistically significant level in Equation One.

The final group of independent variables used in equation one are those calculated in *The Rise of the Creative Class*. None of the variables from this index reached statistical significance, but the 'tolerance rank' was the closest to reaching the threshold value of significance. With a t-value of -1.792, this independent variable trended strongly in the direction of its hypothesized relationship. Its negative association with the dependent variable suggests that, to a limited degree, MSAs that exhibit a greater level of tolerance toward phenomena that are counter to widely accepted social norms (e.g. homosexuality) are, on average associated with a greater ratio of craft breweries per 100,000 residents.

The decision to include the variable 'wage inequality rank' despite its lack of a hypothesized relationship proved to be a valuable one. Although its t-value of 1.081 is not statistically significant, the variable suggests the nature of the intra-metropolitan income distribution. This relationship suggests that it isn't the average income per se that affects the level craft brewing development in an MSA, but the degree of the gap between the highest and lowest wages of residents appears to be related to how many craft breweries are operating in a metropolitan area. A larger wage gap indicates that while some residents are struggling to make ends meet, there is also a portion of the

population that is very well off. Based on this regression model, the metropolitan areas with larger wage gaps seem to be those that are better suited to support craft breweries. Further, the influence of this variable suggests a potential shortcoming of the ‘median household income’ statistic, where intra-metropolitan income variations gloss over stark wage differences that may exist in an MSA, thus making the statistic of limited validity for this analysis.

Of the three remaining variables from *The Rise of the Creative Class*, two trended slightly in their hypothesized directions, but the largest degree of any of these relationships proved to be counter to its hypothesized relationship. “Creativity rank’s” positive association implies that metropolitan areas with a smaller creative workforce are actually slightly more likely to possess a larger number of craft breweries. The other two variables, ‘talent rank’ and ‘technology rank’ exerted almost no relationships, although the directions of both of these weak relationships did prove consistent with their hypothesized directions of association.

4.5 Equation Two: Linear Regression With Variables from *Cities Ranked and Rated*

Equation Two: Linear Regression with Variables from *Cities Ranked and Rated*

Breweries per 100,000 residents = transportation + cost of living + health and healthcare + crime + climate + economy and jobs + arts and culture + leisure + education + quality of life

When only the variables from *Cities Ranked and Rated* are considered in the linear regression analysis, numerous examples exist pertaining to the varying degrees of influence that the independent variables have on the dependent variable when compared to equation 1, where all variables from all sources are considered (Table 4.3). Seven out of the ten variables trend in the direction of their hypothesized relationships, but ‘arts and culture’, ‘leisure’, and ‘economy and jobs’ influenced the dependent variable in the opposite direction of what was anticipated. Without overlapping influences from the other independent variables from other sources, the degree of influence of each of the independent variables in equation 2 is greater.

Five of the ten variables achieve statistical significance in the model at the .05 level, compared to only two variables from *Cities Ranked and Rated* in the first model. The inverse relationship in Equation 2 between the dependent variable and ‘cost of living’ proved to be stronger, which could come as a result of a lack of influence from variables utilized from other sources. Both models make clear the relationship between ‘cost of living’ and the provision of craft breweries at the metropolitan level, where more expensive areas are associated with a greater number of craft breweries.

The metropolitan attribute ‘health and healthcare’ reaches statistical significance at the .05 level in the second model, with a t-value of 2.851. This implies that, on average, metropolitan areas with better healthcare provision are also more suited to have a larger number of craft breweries. Correlation does not equal causation, and the provision of better quality healthcare services does not directly influence the founding of a greater number of craft breweries at the metropolitan level, although the association

Table 4.3: Results of Regression Equation Two (Variables from *Cities Ranked and Rated*)

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	.399	.266		1.502	.134
Transportation	.002	.001	.085	1.561	.120
Cost of Living	-.006	.002	-.219	-3.002	.003
Health/Healthcare	.005	.002	.178	2.851	.005
Crime	.001	.002	.055	.987	.324
Climate	.001	.002	.033	.566	.572
Economy and Jobs	-.002	.001	-.063	-1.199	.232
Arts and Culture	-.007	.002	-.264	-4.322	.000
Leisure	.000	.002	-.021	-.282	.778
Education	.006	.002	.219	3.303	.001
Quality of Life	.005	.002	.180	2.874	.004

R-Square = .271, F-value = 11.886, Sig. = .000, n=331

does imply a relationship between this measure of quality of life in an MSA and the number of breweries present in it when population is accounted for.

The surprising relationship between the dependent variable and ‘arts and culture’ is present again, this time much stronger than in the previous equation when all independent variables were considered. With a t-value of -4.322, the strength of this inverse relationship is much greater than it was in Equation 1, implying that the metropolitan areas with better established ‘arts and culture’ scenes are actually those MSAs with smaller numbers of craft breweries when population is accounted for. While no easy explanation for this relationship exists, it does become clear that, based on how

the factors included in this score, more artsy and culturally oriented metropolitan areas clearly do not equate with a greater number of craft breweries¹⁵.

The anticipated positive relationship between ‘education’ and the dependent variable proved to be true in Equation 2, implying that greater intra-metropolitan emphasis on education is related to a greater provision of craft breweries. In Equation 1, there appeared to be a positive relationship between the dependent variable and this educational measure, but not to a statistically significant degree. By removing the other related measures from other sources (i.e. percentage of residents with at least a bachelor’s degree, and ranks of creativity and talent), the strength of the relationship increased considerably. This relationship is important to consider because it is a more holistic measure of the overall education situation than are the two education-related measures from the *United States Bureau of the Census* and *The Rise of the Creative Class*, and is not affected by factors such as migration, which could potentially distort the statistics because of an influx of educated residents to an area that is not necessarily a product of a respective MSAs educational offerings. This relationship implies that those metropolitan areas that emphasize education at the K-12 level as well as colleges and universities are, on average, more likely to have a greater number of craft breweries.

Finally, ‘quality of life’, trends strongly in the positive direction (t-value = 2.874). This variable measures urban attributes such as the degree of cultural and physical preservation, as well as the overall ease of living in a metropolitan area. The trend of

¹⁵ Again, the manner in which the ‘arts and culture’ value is calculated in *Cities Ranked and Rated* is indicative of the negative relationship present here. The almanac’s mode of simply counting the number of institutions present in an MSA may not be adequate in painting a picture of the arts and culture scene present. Further, this method of scoring tends to greatly favor larger MSAs, and, given that it has been statistically proven that instances of craft brewing are not simply a function of population, the validity of this index is limited for the purpose of this analysis.

craft beer producers to locate in historic buildings, thus preserving the physical and cultural history of the area, seems to be well-represented in this metropolitan measure. Certainly craft breweries are not single-handedly influencing the quality of life measures such as physical and cultural preservation, but more likely are associated with higher ‘quality of life’ metropolitan areas because they are able to fit in better with this type of environment.

4.6 Equation Three: Linear Regression with Variables from *The United States Bureau of the Census*

Equation 3: Linear Regression with Variables from *The United States Bureau of the Census*

Breweries per 100,000 residents = percent with bachelor’s degree or higher + percentage of residents in 25-34 age range + median household income

The inclusion of only the three variables utilized from the *United States Bureau of the Census* in Equation 3 reveals three important considerations regarding associations with the number of craft breweries in a metropolitan area and metropolitan attributes (Table 4.4). First, the presence of a larger percentage of highly educated residents is of utmost importance when evaluating craft brewing in an MSA. The t-value of 6.726 reveals a very strong positive relationship with the dependent variable, indicating that, irrespective of local educational emphasis (as measured by ‘Education’ from *Cities Ranked and Rated*), the presence of residents with at least a bachelor’s degree is of greater importance than any other measure of education at the metropolitan level. MSAs

Table 4.4: Results of Regression Equation Three (Variables from *United States Bureau of the Census*)

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1	(Constant)	.187	.216	.865	.388
	Median HH Income	-1.874E-5	.000	-.188	.008
	Percent with Bachelor's or Higher	5.700	.848	.473	.000
	Percentage 25-34	.007	.041	.009	.867

R-Square = .137, F-value = 17.360, Sig. = .000, n=331

with a greater number of craft breweries are also, on average, much more likely to have a higher percentage of residents with an advanced degree, and metropolitan areas that are lacking a highly educated segment of the population are much less likely to have a large ratio of craft breweries per 100,000 residents.

The independent variable ‘median household income’ displays a statistically significant negative relationship with the independent variable in Equation 3, as was the case when all variables were included in Equation 1. This seems to suggest the inadequacy of the ‘median household income’ measure in predicting the extent of craft brewing in an MSA, because, despite this implied negative relationship, the higher-than-average costs of craft beers necessitate wealthy consumers. Although craft brewers obviously require a segment of the population with a larger amount of disposable income, this statistic does little to reflect such a relationship. Equation 1 indicated that while income obviously is important, it seems to also be reflected at the metropolitan level through a measure such as the wage inequality gap.

Finally, the independent variable ‘percentage of population aged 25-34’ is rendered meaningless in this equation, indicating that the percentage of a metropolitan area falling into the 25-34 age range has virtually no bearing on how successful an MSA’s craft brewing environment will be. This is in strong opposition to the results of the Beer Industry Update (2002) study that indicated the affinity that this age segment had to consuming craft beers. Given the nature of the study, the only two craft-brewed beers selected for the study were the widely available Samuel Adams and Sierra Nevada. The results of this equation make it clear that the two beers included in the study are not consistent with craft breweries as a whole, and the percentage of a metropolitan population that falls into the 25-34 age grouping has little to no bearing on how well-developed an MSA’s craft brewing situation is.

4.7 Equation Four: Linear Regression with Variables from *The Rise of the Creative Class*

Equation 4: Linear Regression with Variables from *The Rise of the Creative Class*

Breweries per 100,000 residents = creativity rank + technology rank + talent rank + tolerance rank + wage inequality rank

Only two of the five variables from *The Rise of the Creative Class* achieve statistical significance (Tolerance Rank and Wage Inequality Rank) in Equation Four (Table 4.5). The variables ‘creativity rank’ and ‘talent rank’ both trend in their hypothesized

Table 4.5: Results of Regression Equation Four (Variables from *The Rise of the Creative Class*)

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1	(Constant)	.978	.133	7.374	.000
	Creativity Rank	.003	.003	.343	.246
	Technology Rank	.000	.001	-.056	.670
	Talent Rank	-.002	.001	-.198	.166
	Tolerance Rank	-.005	.001	-.526	.000
	Wage Inequality Rank	.001	.000	.212	.001

R-Square = .126, F-value = 9.309, Sig. .000, n=331

directions, but not to a significant degree, while ‘creativity rank’ is counter to its hypothesized relationship. The only variable that does not exhibit a strong relationship is ‘technology rank’, implying that there is not a strong relationship between how high-tech an MSA is and the number of craft breweries operating within it.

The strongest relationship to the dependent variable in this regression model was that of a metropolitan area’s tolerance rank, with a relationship of $t = -3.781$. This suggests that metropolitan areas with lower rankings in the tolerance scoring (i.e. the metropolitan areas with a higher degree of tolerance) are the MSAs with a larger number of craft breweries when population is taken into consideration. The relationship was much greater in this equation than was the relationship between ‘tolerance’ and the dependent variable in equation one, which employed all variables from all sources. This confirmed my hypothesis that areas with a greater degree of acceptance of phenomena

counter to mainstream norms would also be more willing to accept the alternative, sometimes off-the-wall craft beers.

The other independent variable from Florida's (2002) index that proved to be significant was the wage inequality rank. The direction of the relationship was positive, implying that MSAs with higher rankings (i.e. higher wage gaps) are equated with greater numbers of craft breweries. This suggests the importance of an economic elite in a metropolitan area to craft brewing success, where a greater divide in intra-metropolitan incomes are associated with a greater number of craft breweries. This statistic proved to be more successful in answering the question of how incomes in a metropolitan area relate to craft brewing. Unlike the Census statistic 'median household income' that yielded a negative relationship to the dependent variable in Equations One and Three, 'wage inequality' proves that there is a relationship between metropolitan wages and the extent of craft brewing, and suggests the importance of an economic elite in an MSA.

4.8 Stepwise Regression:

After first analyzing a linear regression equation with all variables from all sources, followed by evaluating three regression equations employing independent variables from their respective sources, the final procedure will be to implement the stepwise procedure. Stepwise regression continues to add independent variables into the regression equation that have a high degree of significance, and will exclude those variables that are either insignificant or have a high degree of collinearity with other independent variables. The result of this procedure should be a regression equation

possessing only those variables that have the highest degree of predictive power with respect to the dependent variable.

The stepwise procedure produces eight equations, each with an additional variable added. After first utilizing the independent variable that accounts for the greatest amount of variance, the second and subsequent independent variables added to the equation account for the greatest amount of variance that is left unexplained after the first (and subsequently added) independent variable. The tolerance level of .05 in the stepwise procedure implies that no subsequent variables will be added to the equation that are not significant at the .05 level. The eighth and final equation employing eight independent variables produced the highest R-square value of any of the models. The eight variables of great enough significance to be included in the model are: ‘education’, ‘quality of life’, ‘median household income’, ‘percentage of residents with at least a bachelor’s degree’, ‘arts and culture’, ‘wage inequality rank’, ‘crime’, and ‘cost of living’ (Table 4.6). Variables from all three data sources are represented in the final equation, indicating that any overlap that might have occurred from related variables from the disparate sources has been accounted for.

Final Stepwise Regression Equation:

Craft breweries per 100,000 residents = education + quality of life + median household income + crime + percentage of residents with at least a bachelor’s degree + arts and culture + wage inequality rank + cost of living

The final regression equation obtained through the stepwise procedure includes those eight variables that have the greatest predictive power in determining the ratio of craft breweries per 100,000 residents in an MSA. The first of these, ‘percentage of

Table 4.6: Stepwise Regression Equation Results

Variable	Beta	Std. Error	Standardized Beta	t-value	Sig.
(Constant)	1.142	.368		3.102	.002
Education	.004	.002	.165	2.021	.044
Arts and Culture	-.007	.002	-.258	-4.645	.000
Quality of Life	.004	.002	.164	2.722	.007
Cost of Living	-.008	.002	-.292	-4.162	.000
Median HH Income	-3.321E-5	.000	-.334	-4.396	.000
Percent with Bachelor's or Higher	4.001	1.182	.332	3.386	.001
Wage Inequality Rank	.001	.001	.146	2.632	.009
Crime	.003	.001	.110	2.036	.043

R-Square = .306, F-value = 17.704, Sig. = .000, n=331

residents with a bachelor's degree or higher', proves the extreme importance of the presence of a large percentage of highly educated residents through its strong positive relationship with the dependent variable. However, the inclusion of the 'education' variable from *Cities Ranked and Rated* suggests that it is not merely the presence of educated residents in an MSA, but also the more comprehensive measure of the extent of each region's emphasis on education. Due to the stepwise procedure's method of excluding those variables that are highly collinear with other variables, by including both of these variables, it is suggested that these two disparate education measures be included, both of which are influential in predicting the level of metropolitan craft brewing development.

Next, the ‘arts and culture’ independent variable strongly suggests that MSAs with lesser developed arts and culture scenes are more likely to have a greater number of craft breweries. Again, this is in great contrast to what was expected; the hypothesized relationship to this variable predicted that areas with more highly developed art scenes and the provision of cultural activities and events would also be those metropolitan areas with a greater ratio of ‘craft breweries per 100,000 residents’.

Unexpected due to its insignificance in the previous two equations in which it was included, ‘crime’ displayed a statistically significant relationship in the final stepwise regression model, trending strongly in the direction in which it was hypothesized. The t-value of 2.036 provides evidence of an interesting relationship between ‘crime’ and the dependent variable. Based on this equation, MSAs that score higher in the crime rating (i.e. having lower crime rates) are associated with a larger number of craft breweries. According to the final stepwise model, metropolitan areas that are deemed to be statistically safer are more likely to have a greater number of craft breweries when the effects of population are taken into account. The fact that this independent variable was included in the stepwise model after proving to be of minimal importance in the previous models implies that overlap in the other two models in which this index was employed masked the strength of this relationship.

The inclusion of the wage inequality rank in the stepwise model implies that, while the presence of a large amount of disposable income is obviously important, those metropolitan areas with a larger income gap are much more suited for craft brewing than are more egalitarian MSAs. Conversely, the inclusion of the ‘median household income’ variable and its strong negative relationship to the independent variable further supports

the assertion that it is not higher average income levels as reflected by the ‘median’ statistic, but a larger wage gap as reflected by the ‘wage inequality rank’ figure that is most explanatory at the metropolitan level. The fact that both variables yield statistically significant results speaks volumes about the complexity of measuring income and its relationship to craft brewing. Also related to the personal finances of residents of a particular MSA, the inverse relationship of the ‘cost of living’ variable is suggestive of the fact that metropolitan areas that are more expensive have a greater likelihood of a higher degree of craft brewery development.

4.9 Identification and Analysis of Residuals:

Given that the inclusion of these eight independent variables yields the regression equation with the greatest predictive power, the final portion of the metropolitan-level will focus specifically on the greatest residuals from the model (both negative and positive), as well as those MSAs that are able to be adequately predicted through the model, in an attempt to reveal exactly why these respective metropolitan areas are unable (or able) to be adequately predicted. The goal of this evaluative process will be to dig deeper into the factors influencing craft brewery development with the hope of uncovering precisely why some MSAs are not able to be accurately modeled using the stepwise linear regression model. In addition to a more careful analysis of the data, an evaluation marketing techniques will be evaluated. For instance, why might a metropolitan area such as Portland, Oregon, (the metropolitan area with the greatest number of craft breweries) be able to continue to foster the success of such a large

number of craft breweries? Why is the New York MSA unable to achieve widespread success in craft brewing despite its attractive metropolitan characteristics?

Consistent with the structure of the state-level analysis, nine metropolitan areas will be analyzed more closely: the three most underpredicted MSAs that have at least one craft brewery in operation¹⁶, the three most accurately predicted, and the three metropolitan areas that were the most overpredicted based on the final stepwise model (Table 4.7) . It is hoped that a more careful analysis of metropolitan areas of all three MSA types will help to provide an understanding of why the model and its eight predictors are able to satisfactorily project the number of craft breweries in some cases, but also why, despite the highest degrees of predictive power of the eight independent variables, some metropolitan areas do not fit the model well.

4.10 Underpredicted Metropolitan Areas:

Based on the final stepwise linear regression model utilizing eight variables, many metropolitan areas were predicted to have fewer ‘craft breweries per 100,000 residents’ than they actually have. The three most underpredicted MSAs are Portland, Maine, Cheyenne, Wyoming, and Boulder-Longmont, Colorado. In these three cases, the independent variables employed in the model proved to be inaccurate predictors of the extent of craft brewing at the metropolitan level. It would appear, then, that factors other than the eight most significant variables used in the model account for the high degree of

¹⁶ For the sake of this analysis, only the metropolitan areas that have at least one craft brewery are considered for more detailed analysis. Those MSAs devoid of craft breweries are omitted from consideration because little could be gained from studying craft brewing in an MSA that has none.

Table 4.7: Listing of Most Underpredicted, Adequately Predicted, and Overpredicted MSAs

Metropolitan Area	Status	Predicted Value	Actual Value	Residual
Portland, ME	Underpredicted	1.50	5.75	4.25
Cheyenne	Underpredicted	0.75	4.90	4.16
Boulder- Longmont	Underpredicted	1.68	3.78	2.09
Trenton	Accurately Predicted	0.29	0.29	0.000
Kansas City	Accurately Predicted	0.56	0.57	0.000
Miami	Accurately Predicted	0.23	0.22	0.010
Iowa City	Overpredicted	2.06	0.90	-1.16
New York	Overpredicted	1.24	0.13	-1.11
Barnstable/Yarmouth	Overpredicted	1.72	0.62	-1.10

success in the craft brewing environs of these three metropolitan areas. It is hoped that, by digging deeper, factors that are equated with success in craft brewing will be gleaned from an individual analysis of the data, as well as qualitative research in the form of semi-structured interviews with craft brewers producing beers within these three MSAs.

4.11 Portland, Maine:

Based on the model with the greatest amount of predictive power (R-square = .313), the metropolitan statistical area of Portland, Maine, was underpredicted to the largest extent. Its fifteen craft breweries compared to the metropolitan population of 243,547 produce a ‘craft breweries per 100,000 residents’ ratio of 5.75. Based on the metropolitan scores and ratings included in the final stepwise linear regression model

Table 4.8: Portland's Scores and Ranks for Variables in Regression Equation

Education	Arts and Culture	Quality of Life	Wage Inequality Rank
95	64	88	37
Cost of Living	Median Household Income	Percentage with Bachelor's Degree	Crime
13	\$44,707	31.2%	97

(Table 4.8), the Portland MSA was predicted to have a ratio of only 1.23 craft breweries per 100,000 residents. Based on this projection, why, then, is Portland and the surrounding area able to foster the success of a disproportionately large number of craft breweries?

The 2006 combined output of Portland craft breweries was 113,520 barrels, a figure that does not place it anywhere near the top of the list in terms of total craft beer output by MSA based on available data¹⁷. Two breweries located in the Portland, Maine MSA do, however, produce craft beer at a large enough volume to be classified as regional producers¹⁸, the largest type of craft brewery. This fact suggests the importance of distant markets, where the beers produced at these two breweries are marketed in distant areas as well as in their home market. The presence of both of these regional craft breweries, Shipyard Brewing Company and D. L. Geary Brewing Company, in such a small metropolitan area seems to suggest the positive perceptions of Portland-based craft brewers by outsiders, where the beers by these two regional producers are accepted in

¹⁷ Due to incomplete data on brewery outputs, providing a ranked ordering of metropolitan areas based on total annual output is not possible. Enough information related to brewery output is present, however, to make the assertion that Portland, Maine's total output of craft-brewed beers does not rank among the highest. Several craft breweries in other MSAs single handedly trump the output of the combined total of Portland's craft breweries annual output.

¹⁸ For more information related to definitions and characteristics of regional and other types of craft beer producers, please consult Appendix One.

distant markets. As further proof of this, both breweries are able to market their beers by using local references such as lobster fishing, the area's shipbuilding legacy, local icons, and be successful in distant markets (Figure 4.1).

Another interesting trend present in Portland's craft brewing scene are the two examples of craft breweries branching outward to open additional, locally oriented breweries under the same ownership. Both Gritty McDuff's and Sebago Brewing Company have each opened two additional brewing facilities within the MSA, all of which are brewpubs. The locally oriented nature of these facilities is inherent as the designation 'brewpub' implies that a majority of sales be the result of on-site sales, indicating that customers must actually visit the brewery in order to purchase the beer. Both breweries flagship locations are in Portland, but one of each brewery's ancillary locations are situated outside of the central city, suggesting that the hierarchical diffusion process is occurring at the intra-metropolitan level.

The final stepwise regression equation cited the importance of a large percentage of a metropolitan area's residents possessing an advanced degree, and the Portland MSA fits this portion of the mold for an ideal craft-brewing city. At greater than 31%, Portland ranks 27th out of the 331 metropolitan areas present in the United States. In addition to the presence of such a large percentage of educated residents, this metropolitan area also scores very highly (95/100) in the 'education' score. The metropolitan area also ranks in the top fifth in terms of the percentages of talented and creative workers. All signs, therefore, seem to point toward the large importance on all facets related to education that are measured in this analysis.



Figure 4.1: Images of Portland, Maine Craft Beers

Sources: www.gearybrewing.com, www.shipyard.com

Portland also measures up to be an extremely safe place, both in terms of crime and tolerance. The MSA ranks 11th in the tolerance index from *The Rise of the Creative Class*, and scores 97/100 in the crime index from *Cities Ranked and Rated*. Both of these attributes are consistent with the output of the model, which suggests that places that are both safer and more accepting of phenomena counter to mainstream norms (e.g. tolerance for homosexuals) are also more likely to have a greater ratio of ‘craft breweries per 100,000 residents’.

Despite the inverse relationship with ‘wage inequality ranking’ that implies that metropolitan areas with a greater intra-metropolitan wage gaps are equated with a greater number of craft breweries, Portland does not seem to fit this characteristic. With a ranking of 37th place, the metropolitan area appears to be among the more egalitarian MSAs. With less of a wage gap, it would appear that a greater proportion of the

metropolitan population would be able to afford to purchase craft beers, which could help to explain the locally-oriented nature of a substantial percentage of craft breweries in the Portland area. Also related to income, Portland does not fit the model based on the ‘median household income’ variable. The model predicts that MSAs with more developed craft brewing are also those metropolitan areas with lower median household incomes, although the Portland, ME MSA does not rank near the bottom in this statistic. Its ranking of 97th place puts it in the top third of median household incomes among metropolitan areas.

The ‘cost of living’ score for Portland seems to fit the model’s negative relationship with the dependent variable. The final stepwise model equates regions with lower scores (i.e. higher costs of living) in this index with a greater ratio of ‘craft breweries per 100,000 residents’. The metropolitan area’s score of 11/100 indicates that Portland, ME is an expensive metropolitan area to reside in, and also suggests that, due to a demand-driven market, the metropolitan area could be viewed as a “happening” place.

One of the most surprising relationships that the model yielded was the strength of the negative relationship between the dependent variable and ‘arts and culture’, the strongest of any relationships included in the final model. Despite the predicted overlap of the presence of arts and cultural activities and the provision of craft breweries, the model proves the opposite to be true, where, on average, areas with lesser developed arts and cultural scenes are equated with a greater number of craft breweries. Portland, the MSA with the greatest ratio of ‘craft breweries per 100,000 residents’ as well as the most underpredicted metropolitan area in the model, does not neatly fit this relationship

produced by the model. Its ‘arts and culture’ score of 64/100 places it above the national average in this index.

Finally, several examples exist of craft brewers within the Portland, ME area marketing seasonality, which is representative of climatic variations in the area. Its ‘climate’ score of 0/100 indicates its unattractiveness as a place to live in terms of its annual weather patterns. As the metropolitan area with the greatest ratio of breweries per 100,000 residents, Portland, ME thus proves that climate, in fact, is not an important determinant of metropolitan success in craft brewing—a moderate climate is not a necessary component part of an MSA’s overall attractiveness of place. This Maine city actually provides evidence that the opposite could be true, thus refuting my hypothesized relationship that more attractive (i.e., more moderate) climates would be equated with a greater number of craft breweries.

Generally speaking, the components of the model that were evaluated seemed to fit the model fairly well. Its places in the rankings of ‘arts and culture’, ‘wage inequality rank’, and ‘median household income’, however, strayed from the model, with higher-than-average values for ‘median household income’ and ‘arts and culture’, as well as less of a wage gap than the model projected. The two main reasons, then, that the MSA was underpredicted are as follows. First, the presence of the two large (regional) craft breweries in Portland seems to suggest that the region has developed a quality reputation to consumers outside of the region, evidenced by the large range of D. L. Geary and Shipyard Brewing Companies’ distribution and sales. Secondly, the ability of two more

locally-oriented¹⁹ craft breweries to open additional brewing facilities within the MSA indicates the degree to which local demand conditions have fostered the continued success and expansion of craft breweries within the MSA.

4.12 Cheyenne, Wyoming:

The second most underpredicted MSA in the model was Cheyenne, Wyoming, a metropolitan area with very different characteristics related to craft brewing than Portland, Maine. Cheyenne's four craft breweries and 81,607 residents give it a ratio of 4.901 craft breweries per 100,000 residents. In addition to being the second most underpredicted MSA in the model, the Cheyenne area also has the second-greatest ratio of 'craft breweries per 100,000 residents' among metropolitan areas in the United States. The Cheyenne MSA is devoid of any of the two largest types of craft breweries, with the majority (75%) of its craft breweries classified as 'brewpubs'. One contract brewer is present in the MSA, C. B. Potts/Big Horn Brewery, with a production output limited to 1,000 barrels produced in 2006. Only two of the four breweries are located in the central city, while the other two are located in Laramie.

The location of two breweries in Laramie, home to The University of Wyoming, seems to suggest the role that education is playing in influencing craft brewery development. The MSA as a whole, however, does not have a large percentage of residents with at least a bachelor's degree. Cheyenne ranks near the middle of the pack in this category (Table 4.9). This fact serves as one potential explanation of why the

¹⁹ The assumption that these respective breweries are "locally-oriented" is based on the type of craft brewery as well as the relatively small production volumes.

Table 4.9: Cheyenne's Scores and Ranks for Variables in Regression Equation

Education	Arts and Culture	Quality of Life	Wage Inequality Rank
80	6	33	129
Cost of Living	Median Household Income	Percentage with Bachelor's Degree	Crime
94	\$39,607	21.0%	64

MSA was underpredicted due to the regression model implying that craft breweries are more likely to be found in metropolitan areas with a larger percentage of educated residents. Its education score of 80 of a possible 100 from *Cities Ranked and Rated*, however, is consistent with the model's projection that MSAs with a greater overall emphasis on education are, on average, more likely to have a greater number of craft breweries.

In both of the statistics related to income, Cheyenne does not appear to fit the model extremely well. This metropolitan area is not an ideal example of economic equality, evidenced by its middle of the road ranking in the 'wage inequality rank', although it does not rank near the top of metropolitan areas in terms of economic inequality. The 'median household income' value for Cheyenne also ranks near the middle among MSAs at \$39,607, not exactly consistent with the relationship in the model that areas with lower income values are equated with a larger number of craft breweries. Both of these statistics trend in the direction of the model's predicted relationships, although neither are to an extreme degree.

The other statistic indirectly related to household finances is the 'cost of living' variable. The model projects that areas that score lower in this area (i.e. have a higher cost of living) are more likely to have more craft breweries when population is accounted

for. Its score of 94 reveals that the metropolitan area is a relatively cheap place to reside, which is counter to the projections of the regression model. Given that one half of the MSA's breweries are located in the university town of Laramie, the influence students temporarily residing in the area could help to explain this discrepancy.

The low score in the provision of arts and culture for Cheyenne fits the model very well. The 'arts and culture' score of 6 out of a possible 100 depicts an area devoid of such activities available in the MSA, which, according to the model, relates to a larger number of craft breweries. The availability of such activities through the large university present in Laramie seems to be the sole factor contributing any of the six points to the MSAs overall score in this area.

Cheyenne also is not a textbook example of a metropolitan region with a high quality of life. Its score of 33 in this area implies that it is not one of the most inviting cities. This is counter to what would be expected in the model, where greater numbers of craft breweries at the metropolitan level are equated with a higher quality of life. This statistic helps to explain why the area was underpredicted. Based on this quality of life measure, it would not be expected that the metropolitan area would have as large a ratio of 'craft breweries per 100,000 residents'. In this sense, Cheyenne defies the model by having more craft breweries than its 'quality of life' score would imply.

The final independent variable included in the model is 'crime', and the model projects that areas that are safer (i.e. have higher scores in the 'crime' index) are statistically associated with more craft breweries. Cheyenne, however, is by no means a safe haven in southern Wyoming. Its crime score of 64 indicates that crime is at least a moderate problem in the area. The status of Cheyenne's crime score also helps to explain

why the region was underpredicted in the model. Despite its mediocre crime score, the MSA is still able to foster the success of a large number of craft breweries when population is taken into account.

In conclusion, despite the Cheyenne MSA being among the highest ranking metropolitan regions in terms of breweries per capita, Cheyenne, Wyoming is by no means a craft brewing bastion. The smallness of three of the breweries (the brewpubs) and their small annual outputs of less than 400 barrels each helps to explain the reality of Cheyenne's craft brewing situation. With such small production volumes, 75% of the craft breweries in the MSA do not require a great amount of patronage to remain in business. The other brewery, a contract operation, characterized by the production of beers for other breweries, serves as potential evidence of the effect that transportation costs have on beer production and distribution. In this sense, other extraneous craft breweries are using the contract brewer to make their products available in other markets. The contract brewer, C. B. Potts/Big Horn Brewery, therefore is able to exist because of its locational advantage—the somewhat isolated nature of Cheyenne creates a niche for a contract craft brewer to produce beers in this area because direct distribution to the market might prove to be too costly. The final factor that makes Cheyenne's craft brewing scene anomalous is the probable role of the large university, which helps to explain why one-half of the MSA's breweries are located outside of the central city, in the college town of Laramie.

4.13 Boulder-Longmont, Colorado:

Eleven Craft breweries in the Boulder-Longmont metropolitan area compared to its population of 291,288 gives it a value of 3.78 for its ratio of ‘craft breweries per 100,000 residents’, making the Boulder-Longmont MSA the third-highest among metropolitan areas in the United States. Based on the eight metropolitan attributes used to predict a metropolitan area’s ratio of ‘craft breweries per 100,000 residents’ (Table 4.10), the model forecasted that Boulder would have a ratio of only 1.68. Why, then, is this metropolitan area in north central Colorado able to possess more than two times what the model predicted?

Craft breweries within the Boulder-Longmont MSA, on average, produce a greater annual output than either of the other two underpredicted MSAs. Only one craft brewery in the metropolitan area is a regional producer, Boulder Brewing Company, but there are four microbreweries located within the MSA, each with a substantial output when compared to many of the smaller operations analyzed in the previous two metropolitan areas. The fact that so many breweries are bottling their beers and are competitive in distant markets is an important component of Boulder’s brewing situation. It seems to be very clear that an abundance of competition from within the MSA, coupled with the local demand conditions for quality craft brews, has been influential in allowing craft breweries in north central Colorado to rise to prominence.

In addition to the heightened reputation of Boulder as a region capable of producing quality craft beers, another factor has likely aided the success of brewers in this area. Within the framework of resource partitioning theory, it is argued that craft breweries are able to succeed in the shadows of the corporate giants while avoiding direct

Table 4.10: Boulder-Longmont's Scores and Ranks for Variables in Regression Equation

Education	Arts and Culture	Quality of Life	Wage Inequality Rank
97	60	97	31
Cost of Living	Median Household Income	Percentage with Bachelor's Degree	Crime
8	\$55,861	45.7%	52

competition with them. However, in this case, the widely successful marketing campaigns on behalf of one of the nation's largest producers, Coors Brewing Company, and the associations created with "Rocky Mountain freshness", likely has had positive impacts on Colorado craft brewers. It is likely that the notion created by Coors of brewing beers with the clean, pure waters of the mountainous portion of the state has had indirect positive impacts on craft brewers of the area, as well.

The Boulder-Longmont MSA ranks second among metropolitan areas in America in terms of its percentage of residents with at least a bachelor's degree. Nearly half of the residents in the MSA have achieved advanced educational training. The large percentage of educated residents is in accordance with the projections of the model, where metropolitan areas with larger percentages of educated residents are predicted to have a greater number of craft breweries. Additionally, its 'education' score of 97 speaks to the overall quality emphasis on education present in Boulder-Longmont, another factor conducive to craft brewing development, according to the model. The presence of a large research university, The University of Colorado, is undoubtedly influential on the entirety of the education provided in this MSA.

The three factors related to income paint an unclear picture of Boulder when it is compared to the model. First, the ‘median household income’ statistic, \$55,861 for the MSA, is among the highest in the nation, ranking 17th. This value is inconsistent with the projections of the model, where it was predicted that metropolitan areas with lower median income values would have a greater number of craft breweries. In this sense, then, Boulder does not fit the model. The measure ‘wage inequality rank’ also shows how Boulder-Longmont strays from the model, helping to explain why the MSA is under-predicted. The positive relationship between this ranked measure and the dependent variable indicates that metropolitan areas that have a larger wage gap are more likely to have a greater number of craft breweries. The MSA’s ranking in this category implies the lack of a large wage gap in the MSA, indicating a more egalitarian, but nonetheless wealthy, MSA. This is in opposition to the prediction of the model for this independent variable. In the other income-related measure, however, Boulder-Longmont does appear to adhere to the model. The strength of the negative relationship between the dependent variable and ‘cost of living’ implies that metropolitan areas that are more expensive to reside in, on average, have a greater number of craft breweries. Boulder-Longmont’s extremely high cost of living fits this portion of the model precisely.

Boulder-Longmont’s ‘arts and culture’ scene exceeds the provision of these services and activities. The strong negative relationship between this independent variable and ‘craft breweries per 100,000 residents’ implies that metropolitan areas that have a lesser developed arts and culture scene are, on average, more likely to have a greater number of craft breweries. Boulder-Longmont, however, does not fare too poorly in this index. Its score of 60 for ‘arts and culture’ proves that, based on the method of

scoring, the MSA is fairly well developed in this area. This helps to further explain the discrepancy between what the model predicted and the reality of the craft brewing scene in Boulder and the surrounding areas.

The quality of life in Boulder-Longmont, a very high 97, is an urban attribute that seems to fit the model very well. The strength of the relationship between the dependent variable and ‘quality of life’ shows that areas that have an overall higher quality of life are better suited for craft brewing. In this sense, Boulder-Longmont’s extremely high score in this area is representative of its higher-than-average ratio of ‘craft breweries per 100,000 residents’.

Finally, the ‘crime’ score for Boulder is not in accordance with the output of the final stepwise regression model. The relationship of this index with the dependent variable shows that metropolitan areas with higher crime scores (i.e., lower crime rates) have larger numbers of craft breweries when population is adjusted for. The Boulder-Longmont MSA is more crime-ridden than the model predicted. The metropolitan area’s crime score of 52 reveals that the region does have a moderate crime problem, which is in opposition to the established relationship of metropolitan areas with higher crime scores being associated with more craft breweries.

In summary, the Boulder-Longmont metropolitan area appears to exceed the model for a number of reasons. First, agglomeration appears to have had positive effects on the craft brewing scene in Boulder. The large number of craft breweries and their relatively large outputs (hence their competitiveness in distant markets) appear to be the result of the established reputation of the area as a bastion for craft brewing, coupled with the local demand conditions that have helped push several Boulder-based craft breweries

to national prominence. Secondly, although the model suggests that areas with a larger wage gap and lower median household incomes are better suited for more craft breweries at the metropolitan level, the Boulder-Longmont MSA provides evidence that the opposite can be true, as well. With one of the highest median household income values among metropolitan areas, along with a paucity of wage inequality, most residents in the metropolitan area are financially capable of purchasing craft beers. This fact coincides nicely with the positive effects that local demand conditions can have on pushing craft breweries to produce top-notch beers. The other factor that seems to have been beneficial to the brewers of this north central Colorado region is the reputation created by Coor's marketing technique of selling "Rocky Mountain Freshness". Finally, the presence of the large university, The University of Colorado, brings to the area many potential consumers of craft-brewed beers that fall within the age group that the *Beer Industry Update* study point to as being the largest consumers of craft beers.

4.14 Adequately Predicted Metropolitan Areas:

The model predicted that the previous three metropolitan areas would have far fewer craft breweries per 100,000 residents than the MSAs actually have. Important information was gleaned from the more careful analysis of the underpredicted MSAs, such as the presence of intra-metropolitan hierarchical diffusion, the role of large universities, and influences of agglomeration and local demand conditions. This portion of the analysis will evaluate the three most accurately predicted MSAs in the United States based on their ratios of 'craft breweries per 100,000 residents' with the intention of figuring out why these metropolitan areas fit the model so well.

4.15 Trenton, New Jersey:

Trenton was predicted to have 0.29 craft breweries per 100,000 residents, which was precisely the calculated ratio. This metropolitan area, a component of the New York Consolidated Metropolitan Statistical Area, did not deviate from the model, with a residual of 0.00. This MSA, with a population of 350,761, has one craft brewery located within it. Why was the model able to predict Trenton's ratio with no margin of error?

The role of an institution of higher learning appears to be the primary factor leading to the development of craft brewing in Trenton. Its only craft brewery is not located in the central city, but in the university town of Princeton. The Triumph Brewing Company of Princeton, a brewpub, is located on Nassau Street, adjacent to one of the nation's most prestigious universities, Princeton University. The brewpub's proximate setting to the university suggests strongly the importance of the consumer base provided by the university. Further, Triumph's annual output, 1,310 barrels, which is sold primarily on premises, suggests the high rate of success based on local interaction.

Trenton's score of 'education', 73, is lower than all three of the underpredicted MSAs generated by the model (Table 4.11), suggesting that, despite the presence of the world- renowned university, the holistic measure of the education system in the

Table 4.11: Trenton MSA's Scores and Ranks for Variables in Regression Equation

Education	Arts and Culture	Quality of Life	Wage Inequality Rank
73	92	28	12
Cost of Living	Median Household Income	Percentage with Bachelor's Degree	Crime
17	\$56,613	31.0%	33

metropolitan area is not as satisfactory as the other three MSAs. Trenton's lower status in this index makes sense when compared to the model, which equates higher instances of 'craft breweries per 100,000 residents' with higher 'education' scores. With a lower score, Trenton would be more likely to have a lower ratio than the three most underpredicted metropolitan areas, and that proved to be the case. In the other education-based measure, 'percentage of residents with at least a bachelor's degree', Trenton fares near the top of the list with a rank of 28. Given the strong association between larger percentages of highly educated residents and the dependent variable generated by the model, Trenton fits the model well in this respect.

The strongest relationship in the final stepwise relationship was the negative one between the dependent variable and 'arts and culture', which suggests that areas with better access to museums, performances, libraries, etc. would be less likely to have advanced craft brewing developments. Based on this association, Trenton deviates greatly from the model. Its score of 92 in this area reflects an advanced 'arts and culture' scene, which, according to the model, should associate negatively with the model's projection of the craft brewing ratio. It is likely, therefore, that this inconsistency with the model is made up for in one or more of the other indices.

The strong negative relationship between the dependent variable and 'median household income' suggests that areas with higher-than-average median income values are less likely to have a large ratio of 'craft breweries per 100,000 residents'. Trenton, however, fares near the top based on this income statistic. With a median household income value of \$56,613, the MSA ranks 15th among the nation's 331 metropolitan areas. Because of the strong relationship and considerable influence exerted on behalf of this

variable, it would seem likely that Trenton would be underpredicted based on the output of the final model. ‘Wage inequality rank’, the second of the three income-related variables, also appears to deviate from the model, which equates more developed MSAs in terms of their craft brewing ratios with greater instances of wage inequality. Trenton’s rank of 12 in this area indicates the low degree of inequality in wages among residents, which is in opposition to the projection of the model. The last of the income-related variables, however, does seem to adequately fit the model. Trenton’s ‘cost of living’ score of 17 indicates that the area is expensive to reside in, which is consistent with the dependent variable’s negative relationship to this index.

‘Quality of life’, evaluated based on urban attributes such as cultural and physical preservation, attention given to the history of an area, as well as the overall ease of living is related positively to the dependent variable. This thus suggests that metropolitan areas with a higher quality of life should have a greater ratio of craft breweries when population is accounted for. Trenton, however, is not an example of a metropolitan region with higher-than-average quality of life, insinuating that the area would not be well-developed in its craft brewing. This depicts another variable-specific example of how the Trenton MSA deviates from the model, yet, in the end, is predicted adequately.

The final variable included in the regression equation was ‘crime’, taken from *Cities Ranked and Rated*. This measure of one attribute of metropolitan quality of life relates positively to the dependent variable. Trenton, however, does not score highly in this index, obtaining only one-third of the possible points in its crime score. Given the positive relationship between a paucity of crime and the number of craft breweries, the

fact that Trenton does seem to have a crime problem, which would decrease the likelihood of craft brewery foundings in the MSA.

The Trenton metropolitan area, in summation, is not a very well-developed region in terms of its craft brewing. The model was able to predict the precise ratio of ‘craft breweries per 100,000 residents’ despite discrepancies among actual values specific to the Trenton MSA when compared to expected relationships in the model. In reality, the only positive factor that the Trenton area has that is a boon to craft brewing is a large university, and probably the income generated and attracted from it. The Triumph Brewing Company’s locational decision clearly reflects this, as it is situated on a street adjacent to Princeton University. Despite its several examples of deviations from the model, so, too, does the metropolitan area match up fairly well to the characteristics cited in the model as being important in the development of craft brewing. Because of this, it becomes apparent that there are myriad other, unmeasured factors at work in supporting or preventing the development of craft breweries at the metropolitan level. One such example of an additional factor preventing the further development of craft breweries in the Trenton MSA is its proximate location to several other larger metropolitan areas. Competition from breweries in nearby MSAs (such as New York and Philadelphia) could serve as preventative measures for additional craft brewing in the area.

4.16 Kansas City, Missouri and Kansas:

Kansas City, the next of the adequately predicted MSAs (residual = 0.00) is much different than the Trenton MSA in terms of the number of breweries present, a fact not solely the product of the population differential. Within the Kansas City MSA are 10

craft breweries compared to its population of 1,776,062, thus producing a ratio of 0.563 craft breweries per 100,000 residents. The ten breweries operating in and around Kansas City serve as proof of the acceptance of the craft brewing phenomenon by residents of the area. The ‘brewpub’ status of eight of the ten breweries operating in the area serve as further proof of local acceptance of craft brews, where beers from such producers are purchased and/or consumed through onsite sales. In addition to the more locally-oriented brewing operations within the MSA, one of Kansas City’s breweries, Boulevard Brewing Company, is classified as a regional producer based on its large annual output. This suggests that, in addition to being successful at the local level, this large producer of craft beers is able to be successful in locations as far removed as East Tennessee. Craft breweries in the MSA are not limited to the central city; four of the ten breweries present in the metropolitan region are located outside of Kansas City.

The ‘arts and culture’ score for Kansas City is much higher than what the model equates with a larger ratio of craft breweries to population (Table 4.12). The strongest association elicited by the model was the inverse relationship between the dependent variable and the ‘arts and culture’ score. It therefore seems that the Kansas City MSA has too developed an arts and culture scene to be conducive to advanced developments in its craft brewing. Based on this relationship, it would seem to the Kansas City metropolitan area would be underpredicted.

The next most significant variable, ‘median household income’, does not equate very well to the model’s projection of how wealthy the average household within a metropolitan area should be. Kansas City ranks among the top one-third of median household incomes among metropolitan areas in America (73rd), which is in opposition to

Table 4.12: Kansas City MSA's Scores and Ranks for Variables in Regression Equation

Education	Arts and Culture	Quality of Life	Wage Inequality Rank
85	96	60	100
Cost of Living	Median Household Income	Percentage with Bachelor's Degree	Crime
27	\$46,193	26.4%	3

the model's output, where lower-than-average median income values are associated with a greater number of craft breweries. The output for this variable seems counterintuitive to what would be expected in relation to income and the number of craft breweries. The more expensive nature of craft beers would lead one to believe that craft breweries would be more successful in areas where a greater proportion of the population would be able to afford to purchase such products, but, according to the model, the opposite is true. Based on the reality of the model, it would seem, therefore, that Kansas City's relatively high median household income value would be detrimental to its ratio of 'craft breweries per 100,000 residents'.

The next income-related variable, 'cost of living', seems to adhere to the projection of the model. Kansas City's score of 27 in this area implies that the area is expensive to reside in, although not nearly as costly as two of the three most underpredicted MSAs (Boulder-Longmont, Colorado and Portland, Maine). The inverse relationship between the dependent variable and this metropolitan attribute is not as strong as the previous two independent variables, indicating the lesser degree of the relationship between 'cost of living' and the number of craft breweries present in an MSA. Also related to the intra-metropolitan income distribution, Kansas City's 'wage

inequality rank' trends in the direction of how this ranked-order variable performs in the model, which suggests that areas with a larger gap in wages are, on average, more likely to have a greater ratio of craft breweries to population.

The percentage of highly educated residents in Kansas City (those with at least a bachelor's degree) also trends in the direction of what the model suggests. The Kansas City MSA ranks 60th in terms of the percentage of residents with at least a bachelor's degree, a factor that appears to be positively associated with craft brewing. Its ranking in the top fifth among MSAs based on this demographic characteristic helps to explain why the model's projection was accurate for the case of craft brewing in the Kansas City area. Also, the MSA's education score is in accordance with the model; its value of 85 is consistent with the model's positive association between the measure of education and the ratio of 'craft breweries per 100,000 residents', providing evidence of how Kansas City's place-specific characteristics mesh with the projection of the model.

In terms of 'quality of life', the positive relationship to this independent variable in the model is evident with Kansas City. With a score of 60 (out of 100), this Midwestern MSA trends in the direction of the positive relationship implied by the model. Given the relationship to this independent variable generated by the model, the MSA's score in this area helps to explain why it was one of the most accurately predicted metropolitan areas.

The final independent variable, 'crime', does not help to explain why Kansas City's ratio of 'craft breweries per 100,000 residents' was projected accurately. The model equates areas with lower crime rates (i.e. higher crime scores) with greater instances of craft brewing at the metropolitan level. Kansas City's high rate of criminal

activity would lead one to believe that, based on the relationships in the model, craft brewers would be less likely to set up breweries in the Kansas City area.

The Kansas City MSA's ability to sustain the success of ten craft breweries is likely primarily the result simply of it being a fairly large MSA. The only real characteristic of note is the metropolitan area's very poor crime score. Inconsistent with the relationship presented in the model, Kansas City is still able to foster a fairly large number of craft breweries. None of its other characteristics deviate greatly from the model. Finally, the extremely high 'arts and culture' score for Kansas City (96) suggests that the strongest relationship in the model, an inverse one, does not necessarily serve as a large deterrent to craft brewers—a metropolitan area with a well-developed arts and culture scene is still able to be reasonably successful in its craft brewing.

4.17 Miami, Florida:

The Miami, Florida metropolitan area was also accurately predicted by the model. Miami was predicted to have 0.23 craft breweries per 100,000 residents, and, in reality, the ratio is 0.22, yielding a residual of 0.00. For such a large metropolitan area (over two million residents), the Miami area is not very well developed in terms of the number of craft breweries. Only four craft breweries operate within the MSA, all of which have relatively small production volumes. With a very different site and situation of this MSA compared to the other two accurately predicted MSAs, how was the model able to accurately predict this South Florida city as well?

Based on the most significant variable, 'arts and culture', the Miami MSA does not appear to accurately match up with the projections of the model. Scoring 85 out of a

possible 100 on this urban attribute due to its higher than average instances of performing arts and museums, the city and surrounding area seem to be much more developed in arts and culture than the model would expect (Table 4.13). Miami's subtropical climate, however, could indirectly skew the statistics related to arts in culture in the sense that many such activities cater not to the resident population, but to the plethora of tourists who visit the area each year.

The 'median household income' value of \$35,966 for Miami does fit neatly into the model. The lower-than-average dollar value for this statistic is representative of what the model projects, where median income is inversely related to the dependent variable, thus implying that lower average income values for metropolitan areas are equated with a greater ratio of 'craft breweries per 100,000 residents'. Also related to income, 'cost of living' is the independent variable of the third highest value of significance. Its strong negative influence ($t = -4.162$) suggests that MSAs that are more expensive to reside in, on average, have a greater ratio of craft breweries to population. Miami's score of 42 in this area, therefore, does not coincide perfectly with what is suggested by the model. Miami is barely more expensive than the national average, which, according to the stepwise model, does not relate positively to the ratio of 'craft breweries per 100,000

Table 4.8: Miami's Scores and Ranks for Variables in Regression Equation

Education	Arts and Culture	Quality of Life	Wage Inequality Rank
8	85	68	48
Cost of Living	Median Household Income	Percentage with Bachelor's Degree	Crime
41	\$35,966	19.9%	2

residents'. The last of the independent variables included in the final model related to income is 'wage inequality rank', the measure of how great the disparity is between the highest and lowest income values. The positive relationship to this ranked-order variable is a reflection of the association between metropolitan regions with greater wage gaps and a larger ratio of craft breweries. The Miami MSA ranks 48th in this respect, not among the top tier of metropolitan areas in terms of the areas with the largest wage gaps, a fact does not match up positively with what the model predicts as an ideal characteristic for the existence of craft breweries.

The 'quality of life' in Miami is reflective of the model's relationship to this independent variable. With a score of 68 in this area, the Miami MSA's score trends in the direction of the positive relationship implied by the model, indicating, that, with this example, the relationship to the 'quality of life' variable seems to be a sufficient predictor of the craft breweries ratio. However, the more specific quality of life index, 'crime', does not fit the direction of the relationship generated by the model. The MSA's score for crime is 2, which indicates that crime is a very serious problem at the metropolitan level. This should serve as a deterrent to craft brewing, due to the positive relationship in the model, which implies that areas with less recorded criminal activity are more likely to have more developed craft brewing.

In terms of education, the Miami MSA does not fit the model based on the two values used to measure this metropolitan attribute. The first of these, the 'education' score from *Cities Ranked and Rated*, is inconsistent with the positive relationship to this independent variable in the model. The stepwise linear regression model yields a positive relationship to 'education', implying that metropolitan regions with a greater emphasis on

all facets of education (e.g., student/teacher ratios, graduation rates, presence of universities) are associated with a greater of craft breweries per 100,000 residents. In addition to the poor education score, Miami also suffers from a dearth of highly educated residents. With less than 20% of residents who have obtained at least a bachelor's degree, the Miami MSA ranks 186th in this area, providing additional evidence of how, despite its overall accurate forecasted ratio, the metropolitan area deviates from the model.

As was the case for the other two 'accurately predicted' MSAs, Miami also appears to deviate from the model in many respects, such as its much higher-than-average score in 'arts and culture' and its low education-related values. The weights of the myriad of variables, however, do balance out so that it fits the model precisely. Given the multiple discrepancies regarding the individual indices, Miami, along with the other metropolitan areas, reveals the complex nature of attempting to accurately predict the ratio of 'craft breweries per 100,000 residents'. For instance, the negative relationship in the model between the dependent variable and 'median household income' suggests that metropolitan areas with lower-than-average median income values are more conducive to greater instances of craft breweries when population is accounted for. Miami, however, has a relatively low median income value compared to an MSA such as Boulder, yet Boulder is able to support a far greater ratio of craft breweries than is the case with Miami. This is merely one of many examples of how, despite adhering to the most important characteristics selected by the stepwise model, various extraneous factors appear to also be at work, and perhaps often supersede the measured characteristics included in the model. One possible explanation for the relative paucity of craft

breweries in Miami is the role of culture. Miami's Latino population is far greater than the national average, and it seems plausible to conjecture that residents of Latin-American origin have less of a propensity to consume craft beers²⁰. As additional proof of this, the scarcity of craft breweries in Latin America helps to further ground the argument that members of the Latino segment of the population are less inclined to patronize craft breweries or purchase their products.²¹ The other factor that may be at work that is not measured through the model is simply Miami's location in "The South". In the onset of the previous chapter, the lagging status of craft brewing in the South was made very clear in terms of its comparisons to other regions in categories such as raw number of craft breweries and breweries per 100,000 residents.

4.18 Overpredicted Metropolitan Areas:

The final three metropolitan areas, Iowa City, Iowa, New York, New York, and Barnstable-Yarmouth, Massachusetts, were the three MSAs that were the greatest negative outliers. Based on the eight variables utilized by the stepwise regression model, these three MSAs were predicted to have higher ratios of 'craft breweries per 100,000 residents' than what actually exists within them. The cumulative influences of the eight independent variables coincide more closely with what the model cites as ideal characteristics for craft brewing development than do the actual brewing situations of the three MSAs. It is hoped that, by looking more closely at the specific characteristics,

²⁰ A relatively recent study of beer consumption (*Beer Industry Update 2002*) cited White Americans as being the purchasers of greater than 90% of the two craft brews included in the study, thus giving the author grounds for making the assertion that Latino residents are not likely to purchase craft beers.

²¹ Only one craft brewery exists in Central America. The D & D Brewery is located in the mountains of north central Honduras, but caters not to the resident population, but to tourists from abroad. (Throughout a weeklong visit to the brewery, every other patron encountered by the author was European or American).

information will be gleaned that might help to better explain why these metropolitan areas are not able to live up to the model's projections of how well-established craft brewing will be in the three respective MSAs.

4.19 Iowa City, Iowa:

Based on the statistical significance of the eight variables employed in the regression model, the Iowa City metropolitan area appears to be better suited for craft brewing than the reality of its craft-brewed beer provision (Table 4.14). The metropolitan attributes included in the model and their respective influences led to the model's projection of Iowa City possessing a ratio of 2.06 craft breweries per 100,000 residents, but its one craft brewery, when compared to the metropolitan population of 111,006, yields a ratio of only 0.90, making it the most overpredicted of any MSA in America. By looking more closely at the individual characteristics included in the model, a clearer picture will be painted of how each of these eight attributes match up to their relationships to the dependent variable, and, in turn, hopefully pinpointing exactly why Iowa City is not able to live up to its projected expectation.

The only craft brewery within the Iowa City MSA is the Old Capitol Brew Works, a brewpub located in the central city. The recent founding date of this brewery, 2004,

Table 4.9: Iowa City's Scores and Ranks for Variables in Regression Equation

Education	Arts and Culture	Quality of Life	Wage Inequality Rank
98	7	55	42
Cost of Living	Median Household Income	Percentage with Bachelor's Degree	Crime
22	\$40,060	37.8%	76

reveals that until relatively recently, this city was left “untapped” by craft brewers. For the last year of available data, the brewery produced 880 barrels of beer, of which a majority was sold on the premises. Consistent with the brewery’s local market are its marketing techniques. Like many other smaller craft breweries, Old Capitol Brew Works occupies a restored factory building in downtown Iowa City. One of its flagship beers, Farmer Brown Ale, is depicted by a watercolor image of a farmer standing amidst his farmstead, complete with a stein in hand. Their Public House Pale Ale is also representative of the local architecture, proudly displaying the structure in which the brewery is housed (Figure 4.2). The existence of these local references is consistent with the general trend of craft brewers who sell their beers on site (brewpubs), where the obvious interactions with local consumers seem to necessitate an increase the number of references to local phenomena.

The central city of this metropolitan area, home to the only craft brewery within the MSA, possesses a large university, The University of Iowa. In several previous examples, the presence of an institution of higher learning appeared to be of utmost importance in influencing craft brewing. Just as was the case with the Princeton- based craft brewery in the Trenton MSA, Iowa City’s brewery is also located in a proximate location to the University, suggesting the patronage to the brewery on behalf of those associated with the University. The metropolitan area’s two education-based measures appear to mesh very well with the suggestions of the model. The ‘education’ score of 98 reveals the extremely strong emphasis placed on education at the metropolitan level. On top of the high education score is Iowa City’s large proportion of residents with at least a



Figure 4.2: Images of Craft Brewing in Iowa City

Source: www.oldcapitolbrewworks.com

bachelor's degree. In regard to this measure, the Iowa City MSA ranks fifth among metropolitan areas in the country with a large number of highly-educated residents. Given the small population of this MSA, the large percentage of residents with higher education credentials most likely comes largely as a result of the University itself. The high values for both of these metropolitan attributes related to education suggest that craft brewing in Iowa City would be better developed than it actually is.

Of the variables related to economics, only one of the three fits neatly into its relationship suggested by the model. Iowa City's 'cost of living' score is 22, which indicates that the metropolitan area is extremely expensive to reside in. This is consistent with both the hypothesized relationship as well as the output from the model, suggesting that areas that are more costly are also 'happening' places, and are, therefore, more likely

to have a greater ratio of craft breweries per 100,000 residents. The other two variables related to income, however, do not match up evenly with the projections of the model. First, it is suggested by the model's strong negative relationship that those MSAs with lower 'median household income' values are more likely to have a greater number of craft breweries. The Iowa City MSA's median income value of \$40,060 falls within the top one-half of median income values among metropolitan areas in America, which is in opposition to the general pattern between income values and the extent of craft brewing development, where areas with lower median values possess a greater ratio of craft breweries to population. The positive relationship with the independent variable 'wage inequality rank' in the model implies that, on average, areas with a larger wage gap will have more craft breweries. Iowa City's ranking of 42 reveals that it is one of the more egalitarian metropolitan areas in the United States.

The metropolitan region does, however, adhere to the relationship yielded by the 'arts and culture' index, the variable of the greatest significance in the model. Iowa City's score of seven in this area depicts a metropolitan region devoid of many organized arts and cultural activities, which, according to the model (but counter to my hypothesis), areas that lack art museums, performing arts, public libraries, etc. should be more successful in their craft brewing. Regarding another metropolitan attribute from *Cities Ranked and Rated*, 'crime', the model reveals that areas with a less documented criminal activity should have, on average, a greater ratio of craft breweries. This implies that Iowa City is situationally better suited to the establishment of more advanced craft brewing than has actually taken place. Finally, the variable with the fifth-strongest relationship, 'quality of life', trends in the direction of the overall relationship yielded by the model.

The Iowa City MSA scores above average with a value of 55, meaning that the metropolitan area is a relatively desirable place to reside in.

The majority of Iowa City's values for the independent variables included in the model trend in the directions of the relationships yielded by the model. It, therefore, comes as a surprise that Iowa City does not have a greater ratio of craft breweries to population. Iowa City, then, seems to be a location in need of additional investment in craft brewing. With the situational characteristics for metropolitan craft brewing success present, the currently underserved market appears to have room for expansion. In addition to the data suggesting this, a recent statement posted on the website of Iowa City's sole craft brewer further reinforces this notion. While thanking customers for their patronage, The Old Capital Brew Works also issued an apology to customers for not being able to keep up with current demands for their beers (<http://www.oldcapitolbrewworks.com/>). Another factor that seems to suggest that the founding of an additional brewing facility(s) in this metropolitan area could be a profitable endeavor is its relative isolation from a larger metropolitan area. This geographic factor could provide guaranteed markets due to limited competition from other breweries in other MSAs (as could be the case in the agglomeration of metropolitan areas in north central Colorado (Boulder-Longmont, Fort Collins-Loveland, and Denver), for example).

4.20 New York:

As the largest city in America, the relative paucity of craft breweries in the New York MSA comes as a large surprise. Immediately, this raises red flags regarding the

concept of hierarchical diffusion. If a phenomenon such as craft brewing developed first in the largest of population centers and subsequently diffused down the urban hierarchy, then New York City should be much better represented in its craft brewing than it is. The New York MSA's greater than nine million residents, when divided by the number of craft breweries currently in operation, 12, produces a ratio of only 0.13 craft breweries per 100,000 residents. Its underpredicted status becomes apparent when compared to its predicted value, 1.24, making it the second-most underpredicted MSA in America.

One striking factor of craft brewers in New York is the relatively high percentage of brewers engaging in contract work, where three breweries are actually brewing beers for other breweries. This is likely a product of the immensity of the market, where craft brewers from distant areas are able to see tremendous potential in making their beers available to New Yorkers. Due to prohibitive distribution systems and high transportation costs, producing beers through a third-party apparently becomes an attractive option. The Brooklyn Brewery is the largest producer of craft beers in the MSA. Termed a microbrewery, the brewing facility produced 10,673 barrels of their own beer in 2006. However, this amounted to less than one-fifth of its total output, which included 47,277 barrels of beer produced through contracts with other breweries.²² Also of interest when evaluating the craft producers present within the New York MSA is the lack of a regional, large volume producer. This comes as a surprise due to the large resident population, yet there is not a large craft brewery operating within the metropolitan area to serve the large market.

²² Due to rapidly rising transportation costs, it seems probable that the amount of contracted brewing of beers for breweries from distant areas will increase. Given the vastness of the market in New York, continued penetration of the market, while a boon to craft brewers outside of the MSA, may no longer be possible due to transportation costs, thereby making contract brewing an attractive option.

Table 4.10: New York's Scores and Ranks for Variables in Regression Equation

Education	Arts and Culture	Quality of Life	Wage Inequality Rank
99	100	92	12
Cost of Living	Median Household Income	Percentage with Bachelor's Degree	Crime
2	\$41,053	27.2%	77

In the comparison of New York's value of 'arts and culture', the variable of greatest significance in the model, to the projections of the model, there is strong opposition to the predicted relationship of this variable. New York scores 100 in this urban attribute, making it the most highly developed metropolitan area in terms of the provision and facilitation of arts and culture (Table 4.15). The strength of the negative relationship in the model suggests that this would be detrimental to the success of craft brewing in New York, and, for whatever reason, this appears to be true for this metropolitan area.

Only one of the three metropolitan attributes related to finance appears to fit the model. New York's extremely high 'cost of living' coincides with the overall negative relationship of this variable to the independent variable in the model. Its score of two implies that the New York metropolitan area is an extremely expensive place to live, which, as a general rule, appears to be conducive to higher instances of craft brewing at the metropolitan level. The other two variables influenced by incomes, however, do not fit the relationships elicited by the model. First, the 'median household income' value for New York is \$41,053, only slightly below the national average (\$41,241) at the metropolitan level. The strength of the negative relationship to this independent variable suggests that those metropolitan areas with far lower median income values are more

likely to have greater instances of craft breweries. In this sense, then, New York does not fit the projected relationship of the model very well. New York's status in 'wage inequality rank' deviates even more from the relationship yielded by the model. The positive relationship to this ranked order variable suggests that MSAs with a greater degree of wage inequity are associated with a larger number of craft breweries, but New York proves to be, based on this statistic, one of the nation's most egalitarian metropolitan areas.

Another factor that leads to the New York MSA's underpredicted status is the percentage of residents with at least a bachelor's degree. The metropolitan area's rank of 52 in this area shows that New York, in this sense, trends strongly in the direction of the relationship to this independent variable yielded by the model. 27.2% of New Yorkers have obtained at least bachelor's degree, a fact that would lead one to believe that more craft breweries would be in operation than the 12 that are currently brewing in the MSA. The other measure related to education, the index from *Cities Ranked and Rated*, also contributes to the metropolitan area's under-predicted status in terms of the craft brewing ratio. New York scores among the highest in the nation with a value of 99 (out of 100) in this holistic measure of educational emphasis, which tends to relate positively to the number of craft breweries present at the metropolitan level. Despite values in both of these areas that indicate that the New York MSA would be better established in its localized craft brewing, the data show that this is not the case.

With a value of 77 for the 'crime' score, New York appears to be a relatively safe metropolitan area. For a number of reasons, a relative lack of crime associates with a greater number of craft breweries. Even though the MSA's score in this area trends in

what the model cites as being ideal for craft brewing, the reality of craft brewing in New York does not support this relationship. The final metropolitan attribute included in the model, 'quality of life', also coincides with what the model suggests is ideal for craft brewing. The score of 92 in this area reflects a city that is an overall very attractive place to live, but, given the relative paucity of craft breweries, the market of this metropolitan area does not live up to its prediction.

With all of the ideal characteristics for craft brewing development present, coupled with the largest population concentration in the nation, why, then, does New York lack the breweries that would have equated to its projected ratio? Two major reasons seem to be at work in preventing the New York area from establishing a greater number of breweries. First, the high land prices as well as high operating costs most likely serve as deterrents from the founding of additional craft breweries. The establishment of a craft brewery requires a large amount of space, and given the high costs of land in and around New York City, it may simply not be profitable to establish a craft brewery in many places. Additionally, the fact that the New York MSA is among the most populous regions in the country could indirectly negatively affect would-be craft brewers in the area. The enormity of the market makes it an attractive location within which to sell beers from breweries. Given this, it is likely that the large degree of competition on behalf of breweries from other areas of the country would make it more difficult for a local operation to get its foot in the door.

4.21 Barnstable-Yarmouth, MA:

The final overpredicted MSA to be discussed in this portion of the analysis is Barnstable-Yarmouth, located in eastern Massachusetts on Cape Cod. Its 162,582 residents, when compared to its one craft brewery, produce a ratio of 0.62 craft breweries per 100,000 residents. According to the model, the Barnstable-Yarmouth MSA's characteristics should be equated with a ratio of 1.72 craft breweries per 100,000 residents. If the metropolitan characteristics positively associated with the development of craft brewing are in place, why, then, does the Barnstable-Yarmouth MSA only amount to approximately one-third of the model's projections?

The only craft brewery located within this metropolitan area is Cape Cod Beer, a microbrewery in the town of Hyannis, which produced 1,200 barrels of beer, according to the most recent data available. Beyond the associations with the famed New England tourist destination, the brewery makes nothing more than these generic associations with place, as is evidenced by names such as: Cape Cod IPA, Cape Cod Red, Cape Cod Summer, and Cape Cod Porter. A statement on their website states that, "It's about brewing the best beer possible, on Cape Cod, for people who love Cape Cod" (<http://www.capecodbeer.com/>). This seems to imply that the brewery is attempting to cater to tourists to the area, which is within a few hours' drive from Boston.

Coinciding with the model's negative relationship between the dependent variable and 'arts and culture', Barnstable-Yarmouth's score in this area, 41, trends slightly in the direction of the model's implied association with this metropolitan attribute (Table 4.16). So, too, does the MSA's score in 'crime', 90, which fits the projected relationship of less crime in an area being better suited for craft brewing. The 'quality of life' score for this

Table 4.116: Barnstable-Yarmouth's Scores and Ranks for Variables in Regression Equation

Education	Arts and Culture	Quality of Life	Wage Inequality Rank
94	41	42	220
Cost of Living	Median Household Income	Percentage with Bachelor's Degree	Crime
7	\$46,034	31.9%	90

metropolitan region in eastern Massachusetts, however, does not trend in the same direction that is implied by the model. The stepwise model equates areas with a higher quality of life to be more suited to craft brewing, while Barnstable-Yarmouth scores only 42 in this area.

Economically, Barnstable-Yarmouth appears to fit nicely into the model, with the majority of the money-based attributes trending in the directions of the model. Of greatest note is the MSA's 'wage inequality rank' of 220, indicating that the area is among the greatest in terms of inequitable distribution of wealth. According to the model's positive relationship to this ranked-order variable, areas with higher ranks (i.e. greater degrees of wage inequality) are associated positively with the ratio of craft breweries per 100,000 residents. The vastness of this wage gap could come as a result of wealthy Boston residents migrating to this area. Also fitting the model is Barnstable-Yarmouth's 'cost of living' score of 7, indicating that the metropolitan area is extremely expensive to reside in. Given that the model equates more expensive areas to a greater degree of craft brewing development, these two factors would lead researchers to believe that Barnstable would have a greater ratio of craft breweries per 100,000 residents. The final independent variable related to income, however, does not match up to the strong

negative relationship present between the dependent variable and ‘median household income’. The dollar value of \$46,034 puts Barnstable-Yarmouth well within the top one-fourth of MSAs in terms of median income. This is in opposition to the model, which predicts that metropolitan regions with lower median household incomes will be better developed in their craft brewing.

The provision of, and emphasis on, quality education in this area coincides with what the model deems to be an important factor in the development of craft brewing. With the positive relationship between ‘education’ and the dependent variable, an MSA with a high value such as Barnstable-Yarmouth (94) would be expected to be well-developed in its craft brewing. The area’s percentage of highly educated residents, 32.0, ranks 24th among MSAs in America in terms of the percentage of metropolitan residents who have obtained at least a bachelor’s degree. This, according to the model, is a very important characteristic for the establishment of craft brewing at the metropolitan level. Despite its favorable scores related to education, Barnstable-Yarmouth simply does not live up to the expectations provided by the model.

With the majority of its metropolitan attributes trending in the directions consistent with what the model deems to be predictors of success in craft brewing, why, then, is Barnstable-Yarmouth not able to foster the number of breweries that would coincide with its predicted ratio? Proximity to a larger MSA seems to be the reason in this case. The Boston MSA ranks 12th in terms of the total number of breweries operating within an MSA, of which there are eight bottling operations. It is plausible to suggest that the distribution of many Boston-based craft beers to the Barnstable-Yarmouth MSA make it increasingly difficult for much competition to arise from within

the MSA. The market that is ostensibly served by Barnstable's one resident craft brewer further supports this assertion based on its marketing techniques, which seems to single out the tourist market to the Cape Cod area.

4.22 Summary Findings in Metropolitan Analysis

The analysis of the nine individual MSAs based on their residual status was useful in uncovering additional situational factors regarding the founding of craft breweries. For instance, in numerous examples, the presence of large research universities helped to explain the craft brewing situation at the metropolitan level. The Trenton MSA's sole craft brewery's locational decision, for example, to establish the Triumph Brewing Company adjacent to Princeton University underscores the important influence that an institution of higher learning can have on craft brewing. This is also the case in Cheyenne, Wyoming, where half of the MSA's craft breweries are located outside of the central city in the university town of Laramie.

Additional factors affecting the degree of craft brewing development were also suggested throughout the analysis of both the outliers as well as the adequately predicted MSAs. Proximity to a larger, more developed MSA appear to negatively affect the development of craft brewing in Barnstable-Yarmouth, as Boston contains an abundance of craft breweries. Especially in the case of Boulder-Longmont (but to a lesser degree, Portland, Maine), the role of the area's reputation was used as an explanation as to why an area can be so successful at craft brewing at the local level, as well as producing craft beers at a large enough volume to penetrate distant markets (as is evidenced by the large production volume of many of Boulder's bottling operations).

The New York metropolitan area uncovered some important specifics pertaining to how craft brewing plays out in a first-tier city and its surrounding area. This MSA, according to the model, is extremely underserved based on the number of craft breweries in operation there. The percentage of contract brewers operating there, however, helped to explain the reality of craft brewing in New York. Given the large potential market, several brewers from other areas are engaging in contract work with beer production facilities within New York, thus cashing in on the market while averting problems such as prohibitive distribution and high transport costs. Furthermore, the effects of high land rents seem to deter the founding of additional craft breweries in New York.

The validity of the model's predictions was confirmed in the case of the Iowa City metropolitan area. As the most overpredicted (i.e. underserved) MSA cited by the model, it appears that, given the metropolitan area's attributes, the city should be better represented in its number of craft breweries. An announcement on the lone Iowa City craft brewery's website only confirmed the projection of my model, stating that their production was unable to keep up with heightened demands.

Intra-metropolitan diffusion was also a factor that helped to explain the discrepancy between the model's prediction of Portland, Maine's ratio of 'craft breweries per 100,000 residents' and the actual ratio. Several examples of this phenomenon are present in Portland, Maine, where craft brewers, upon opening their first craft breweries, have opened additional brewing facilities at other locations within the MSA. Portland appears to be unique in having experienced such a pattern of intra-metropolitan diffusion; this has not happened in other metropolitan regions in America.

Given the myriad of site-specific examples used to explain the extent of craft brewing development in the nine respective metropolitan areas, the complexity of the situation becomes apparent. While the model undoubtedly has some validity, with an R-square of only .306, it would appear that various other factors appear to be of equal or even greater importance. The complexity of attempting to model and accurately predict the degree of craft brewing development at the metropolitan level is of great difficulty due to many factors that simply cannot be measured. For instance, while the model was able to incorporate the percentage of highly educated residents in Boulder-Longmont, Colorado, it was not able to capture phenomena such as the role of local demand conditions, nor the heightened reputation of beers produced in this area, perhaps a product of Coor's Brewing Company's aggressive marketing campaigns.

In a final effort to establish patterns among the three most underpredicted, adequately predicted, and overpredicted MSAs, the following table was created to discern variations among the independent variables included in the model (Table 4.17). For each of the eight variables, an average was taken of the three MSAs within their respective status category in an attempt to establish patterns among the groupings of MSAs within their respective predicted statuses.

The results, however, rather than making clear some of the similarities among the groupings of under-, adequately, and over-predicted MSAs and their relationships to the model, actually do much to make their respective relationships with the craft brewing ratio even more confusing. First, the strongest relationship of any of the independent variables was 'arts and culture', which trended strongly in the negative direction. That being said, the results of this table of averages show that, despite the predicted negative

Table 4.12: Averages of the Under-, Adequately, and Overpredicted MSAs

Variable	Under-Predicted	Adequately Predicted	Over-Predicted
Arts and Culture	43.3	91	49.3
Median HH Income	\$46,725	\$46,257	\$42,382
Cost of Living	38.3	28.3	10.3
Percentage with at least a bachelor's degree	32.6%	25.8%	32.3%
Quality of Life	72.7	52	63
Wage Inequality Rank	65.7	53.3	91.3
Crime	71	12.7	81
Education	90.7	56.3	97

association, the average of the three adequately predicted MSAs was 91, indicating a large presence of arts and culture in these metropolitan areas. The next-strongest relationship, ‘median household income’, was also a negative one, suggesting that areas with lower average household incomes were more likely to have a greater ratio of ‘craft breweries per 100,000 residents’. The results of the averages table for this variable, however, do not necessarily support the established relationship of the model. The average income for the three adequately predicted MSAs is not lower than the underpredicted metropolitan areas, nor, more surprisingly, it is lower than the metropolitan areas that were overpredicted. ‘Cost of living’, another measure related to finances, however, does fit the model of what would be expected based on the status groupings. The most overpredicted MSAs scored the highest, followed by the adequately predicted MSAs, and finally the underpredicted MSAs. Based on the projections of the model, this would be expected, where the predictions of the model would project a

greater ratio as the ‘cost of living’ score decreased, explained by the notion that areas that are more expensive places to reside would be expected to have a greater ratio of craft breweries.

Another relationship suggested by the model is that areas with a greater percentage of highly educated residents are associated with a greater ratio of ‘craft breweries per 100,000 residents’. This would seem to indicate that areas that were under-predicted (i.e. projected to have fewer breweries than they actually do) would have a lower percentage of residents with at least a bachelor’s degree. This, however, is not the case: the lowest of such percentages is actually associated with the average score of the three adequately predicted metropolitan areas, but, based on the overall relationship, it would be expected that the MSAs that were predicted adequately would be associated with the higher-than-average median incomes that are implied by the overall relationship. Additionally, the three most underpredicted metropolitan areas actually have the highest average of ‘percentage of residents with at least a bachelor’s degree’ of any of the three groupings.

The variable ‘crime’ and its averages for the three categories of MSAs present another example of how the actual craft brewing situations differ from the established relationships. Higher crime scores are associated with greater instances of craft brewing, but the average score of the three adequately predicted MSAs does not fit this portion of the relationship. The adequately predicted MSAs produce an average of only 12.7, indicating that the model was able to accurately forecast these MSAs despite their lack of adherence to this relationship within the model. Similarly, the ‘quality of life’ averages for each of the status groupings presents additional confusion. The model equates

metropolitan regions with a higher quality of life. The adequately predicted MSA average and its composite score of 52, however, is the lowest among the three groups, further emphasizing the inconsistencies between the metropolitan attributes and their influences on craft brewing.

While the attempted goal of creating the above table was to display consistency among the three groupings' scores for each of the metropolitan attributes and their respective status averages, the results paint an increasingly unclear picture. In several instances, the opposite of what was anticipated occurred, frequently as a result of the adequately predicted average scores trending in the opposite direction of what the model projects. The results of this table, therefore, are primarily useful in displaying the high degree of complexity related to factors influencing craft brewing development. Although the model does undoubtedly have validity in projecting the general trends influencing the extent of craft brewing development at the metropolitan level, site-specific characteristics have the ability to successfully supersede the attributes deemed important at the metropolitan level. The use of the most extreme outliers in both directions, as well as the metropolitan areas that best fit the model, were helpful in underlining the potential of an area to deviate from the model, yet still be successful in craft brewing, as well as the opposite. The conclusion of this final analysis and the chapter as a whole should thus be that yes, important traits and characteristics and their respective relationships to craft brewing at the metropolitan level can be used as generalized predictors of degrees craft brewing development. The role of immeasurable forces (i.e. culture and reputation), however, can have an even greater impact on the degree of craft brewing in a metropolitan area.

CHAPTER FIVE: SUMMARY FINDINGS

5.1 Conclusions:

The emergence of craft brewing as an alternative to mainstream, generalist beers in American society has inarguably changed many aspects of how beer is viewed in the United States over the last three decades. Throughout the thesis and its respective scales of analysis, it has become apparent that the phenomenon has not dispersed evenly to all parts of the country. Rates of craft brewing are not be merely a function of population, but rather are the product of specific factors, population being only one of many. These factors, at the levels of state and metropolitan, were, to an extent, revealed by regression analyses. At both scales, however, the regression equations failed to account for a majority of the variance, as evidenced by the relatively low R-Square values. It is strongly suggested, therefore, that many factors that simply cannot be easily measured are at work, and often supersede what the measurable data suggest.

At the regional and divisional (i.e., subregional) scales, differences related to how well-developed each region and division (subregion) are in craft brewing are very apparent. The states comprising the West region are far more established in terms of the ratio of 'craft breweries per 100,000 ratio' than are other regions of the country. The South, on the other hand, is the least developed of any of the four regions in America. No specific factors at this scale were evaluated in relation to craft brewing. These regional disparities in craft brewing are, however, important in understanding that the phenomenon has not diffused evenly throughout the country. The South region, comprising the largest percentage of the nation's population, has the lowest number of

craft breweries, as well as the smallest ratio of ‘craft breweries per 100,000 residents’, thus revealing that the phenomenon of craft brewing is not merely a function of population. Myriad site-specific factors are at work in influencing the development or determining the establishment of craft breweries.

The scale of focus was then narrowed to home in on the nine divisions (subregions) within each of the four regions. The more narrowly focused look at craft brewing produced some additional important information. For example, while the South as a whole is the least developed of the nation’s region, one of its three subregions, the South Atlantic, is much more developed than are either of the two other subregions (i.e., the East South Central and West). The entire West region is the most highly developed in terms of the number of craft breweries as well as the ratio of ‘craft breweries per 100,000 residents’, and both of its component subregions, Mountain West and Pacific, are a reflection of this, possessing the two highest ratios of ‘craft breweries per 100,000 residents’.

The analysis of individual states revealed that the three most highly developed states (Vermont, Maine, and Montana, respectively) are not among the states with the greatest populations. The role of tourism at the state level, although not reflected through the tourism-related statistic used in the state-level regression equation, appears to play a significant role in influencing the high degree of craft brewing development in these three states. The qualitative portion of the analysis at the state scale strongly suggested this, where many examples exist of craft brewers marketing the perceptions of place. This was in contrast to the marketing techniques employed by craft brewers in states that are less successful, where craft brewers appear to be far less inclined to “sell” the local

environment than was the case in the three most well represented craft brewing states. Finally, the qualitative portion of the analysis for the bottom-of-the-barrel states, all of which are considered southern states, revealed the negative influence that conservative perceptions related to alcohol, as well as preventative state-level regulations, can have on the establishment of alcohol-producing businesses such as craft brewing.

The state-level regression equation yielded important information related to factors influencing craft brewing development. The percentage of craft breweries within a state existing outside of metropolitan areas produced the greatest t-value of any independent variable, suggesting that the percentage of non-metropolitan craft brewing development is indicative of how well-developed craft brewing is in a particular state. The independent variable ‘percentage of residents with at least a bachelor’s degree’ proved to be positively related to the dependent variable in this equation. The statistically significant relationship between the dependent variable and ‘state expenditures per capita’ also yielded a positive value, implying that those states that provide more in the form of services (and, as a general rule, more left-leaning) are better developed in their craft brewing. Finally, the influence of median household income in the regression equation, which was counter to the hypothesized relationship, relating negatively to the dependent variable. The validity of this association is questionable, however, as intrastate variations in terms of wealth likely mask any patterns discernable at the state level. Additionally, the strong role that tourism plays in the continued success of many craft breweries lessens the importance of the incomes of local residents.

The final scale of analysis, the metropolitan level, was useful to better understand the factor conditions necessary for craft breweries to flourish. The stepwise regression

model with the highest R-square value revealed the following important information. When the effects of population are adjusted for, craft breweries appear to be most successful in metropolitan areas that: 1). Have a greater educational emphasis, 2). Have a relatively underdeveloped arts and culture scene, 3). Have a relatively higher quality of life, 4). Are relatively more expensive to reside in (i.e. have a higher cost of living), 5). Have a lower-than-average median household income value, 6). Have a higher percentage of residents who have achieved at least a bachelor's degree, 7). Have a relatively high level of intrametropolitan wage inequality, and, 8). Have a relative paucity of crime.

While all of these eight variables achieved statistical significance at the .05 level, these characteristics should not be viewed as the end-all determinants of craft brewing at the metropolitan level. The R-square value of .306 in this equation revealed the limited predictive power of the metropolitan stepwise regression model. As was discovered in the analysis of metropolitan outliers, it is often the case that other (unmeasured) characteristics are equally, and sometimes more important in influencing the extent to which craft brewing develops at the metropolitan level. For instance, situational factors such as the presence of a large university, proximity to other metropolitan areas, the degree of intrametropolitan diffusion of craft breweries (especially in the case of Portland, Maine), and outside perceptions of place (especially in the case of Boulder-Longmont, Colorado) can be of greater importance in influencing craft brewing development than can any of the variables used in the regression models. The careful evaluation of the largest outliers on both sides of the regression line underscored this, with under-and overpredicted areas being affected by such immeasurable factors.

There is still much future research necessary in order to fully grasp an explanation of why craft brewers choose to locate in some areas, but not others. A more careful probing of craft brewers themselves would help provide an added understanding of the craft brewing phenomenon from a locational perspective. Questions related to where craft brewers learned the art of brewing could provide insight into the manner in which the diffusion process has occurred. The interviewing of brewers also has the potential to reveal that, in some cases, it is not the identification of a potentially profitable market that leads to the establishment of a craft brewery, but other extraneous factors (i.e. the husband or wife of a brewer has a good job in a specific location) that are responsible for brewery formation. Additional research could be in the area of market analysis by evaluating the markets of different types of craft breweries—how different are the interactions of smaller craft brewers (i.e. brewpubs) compared to those of regional producers, the largest brewers of craft beers?

REFERENCES

- Abita Brewing Company. <www.abita.com>.
- Alltech's Lexington Brewing Company. <www.kentuckyale.com>.
- Anderson, Chris. 2004. The Long Tail. *Wired*. 12 (10).
- Appalachian Brewing Company. <www.abcbrew.com>.
- Bar Harbor Brewing Company. <www.barharborbrewing.com> .
- Beer Industry Update: A Review of Recent Developments*. 2002. Beer Marketer's INSIGHTS, Inc.
- Boulevard Brewing Company. <www.blvdbeer.com>.
- Bourdieu, Pierre. 1984. *Distinction: A Social Critique of the Judgement of Taste*. Translated by Richard Nice. Cambridge, Massachusetts: Harvard University Press.
- Boselovic, Len. 2006. Anheuser Busch Buys Rolling Rock Brands. *Pittsburgh Post Gazette*. May 20.
- Brewers Association. 2007. *The New Brewer*. 24(3): May/June.
- Brewers Association. 2007. <<http://www.beertown.org/>>.
- Carroll, Glenn R., and Anand Swaminathan. 2000. Why the Microbrewery Movement? Organizational Dynamics of Resource Partitioning in the U.S. Brewing industry. *American Journal of Sociology* 106(3): 715-760.
- Cooke, Phil. 1989. The Contested Terrain of Locality Studies. *Tijdschrift voor Economische en Sociale Geografie*. 80: 14-22, 27.
- Crescent City Brew House. <www.crescentcitybrewhouse.com>.
- DiNardo, Kelly. 2008. Beer is Bubbling Up in Fashionable Places. *USA Today*. February 8, 2008.
- Firehouse Brewing Company. <www.firehousebrewing.com>.
- Flack, Wes. 1997. American Microbreweries and Neolocalism: "Ale-ing" for a Sense of Place. *Journal of Cultural Geography* 16(2): 37-53.
- Flaherty, Julie. Now, the Glass Is Half Empty: Microbreweries in the Slow Lane. *The*

- New York Times*. May 30, 2000.
- Florida, Richard. 2002. Bohemia and Economic Geography. *Journal of Economic Geography*. 2: 55-71.
- Florida, Richard. 2002. *The Rise of the Creative Class*. New York: Basic Books.
- Galbraith, Aaron. 2008. Selling Neo-Localism. Talk. Association of American Geographers Annual Meeting: Boston, MA.
- Gatza, Paul. 2007. Interview. Brewers Association.
- Gierach, John. 1994. *Dances With Trout*. OR: Simon and Schuster.
- Gottman, . Megalopolis: *The Urbanised Northeastern Seaboard of the United States*. Cambridge, MA: MIT Press.
- Gritty McDuff's Brewery. <www.grittys.com> .
- Hannan, Michael T., and Carroll, Glenn R., and Polos, Laszlo. 2003. The Organizational Niche. *Sociological Theory* 21(4): 310-340.
- Hart, John Fraser. 1972. The Middle West. *Annals of the Association of American Geographers* (Vol. 62, No. 2): 258-282.
- Heiner Brau: The Downtown Microbrewery. <www.heinerbrau.com>.
- Hofbrauhaus Newport. <www.hofbrauhausnewport.com>.
- Jackson, Michael. 1996. *The Simon and Schuster Pocket Guide to Beer*. New York: Simon & Schuster.
- Johnson, Steve. 1993. *On Tap: Guide to North American Brew Pubs*. WBR.
- Johnston, Ron and Sidaway, James D. 2004. *Anglo-American Human Geography Since 1945*. 6th ed. London: Hodder Education, Arnold.
- Kennebec River Brewing Company.
<http://www.northernoutdoors.com/site/resort/the_forks_resort_center/kennebec_river_brewery.html>.
- Kentucky Office of Alcoholic Beverage Control. 2007.
- Kentucky Revised Statutes. 2007. 242.123 and 242.1242.

Kesmodel, David. Small Brews Show They're Not Weak Beer. *The Wall Street Journal*. December 10, 2007.

Lazy Magnolia Brewing Company. <www.lazymagnolia.com>.

Lewis and Clark Brewing Company. <<http://www.lewisandclarkbrewing.com/main.php>>

Louisiana State Law. 1987. LA R.S. Section 26:147.

Maclean, Norman. 1975. *A River Runs Through It and Other Stories*. Chicago: The University of Chicago Press.

Magic Hat Brewery. <<http://www.magichat.net/>> .

Marcial, Gene G. 1998. Microbrews - - Without the Froth. *Business Week*. March 16.

McGranahan, David A. and Wojan, Timothy R. 2007. The Creative Class: A Key to Rural Growth. Economic Research Service/USDA. www.ers.usda.gov/amberwaves. April.

Mississippi Brew Blog. 2007. <<http://www.msbrew.com/2007/11/beer-drinkers-map-of-mississippi-t.html>>.

Mississippi Code Section 67-1-3. 1972.

Neptune Brewery. 2008. http://www.neptunesbrewery.com/Our_Beers.php .

Porter, Michael E. 1980. *Competitive Strategy*. New York: Free Press.

Porter, Michael E. 1990. *The Competitive Advantage of Nations*. New York: Free Press.

Porter, Michael E. 2003. The Economic Performance of Regions. *Regional Studies*. 37(6/7): 549-578.

Saint Louis Brewing Company/Schlafly Bottleworks. <www.schlafly.com>.

Schnell, Steven M. and Joseph F. Reese. 2003. Microbreweries as Tools of Local Identity. *Journal of Cultural Geography* 21(1): 45-69.

Schoenberger, Erica. 1991. The Corporate Interview as a Research Method in Economic Geography. *The Professional Geographer* 43(2): 180-189.

Shipyard Brewing Company. <www.shipyard.com> .

- Sperling, Bert and Peter Sander. 2004. *Cities Ranked & Rated*. Hoboken, New Jersey: Wiley Publishing.
- Stack, Martin. 2000. Local and Regional Breweries in America's Brewing Industry, 1865-1920. *The Business History Review* 74(3): 435-463
- Stone, Daniel. 2008. U.S. Brewers Bid for Influence on Capitol Hill. *Newsweek*: May.
- Stoudt, Gretel. 2001. Interview.
- Stoudt's Brewery. <<http://www.stoudtsbeer.com/brewery.html>>.
- Swaminathan, Anand. 1998. Entry into New Market Segments in Mature Industries: Endogenous and Exogenous Segmentation in the U.S. Brewing Industry. *Strategic Management Journal* 19: 389-404.
- Trailhead Brewing Company. <www.trailheadbrewing.com>.
- Tremblay, Victor, and Carol Horton Tremblay. 2005. *The U. S. Brewing Industry*. Cambridge, Massachusetts: MIT Press.
- Troeg's Brewing Company. <www.troegs.com>.
- Tuan, Yi Fu. Rootedness Versus Sense of Place. *Landscape* 24: 3-8.
- United States Census Bureau. 2006. Income Climbs, Poverty Stabilizes, Uninsured Rate Increases. <http://www.census.gov/Press-Release/www/releases/archives/income_wealth/007419.html>
- Victory Brewing Company. <www.victorybrew.com>.
- Watertown, South Dakota Chamber of Commerce. <<http://www.watertownsd.com/>>.
- West Yellowstone Traveler. 2008. <www.westyellowstonetraveler.com>.
- Wolf, Bonnie. Stout and Szechuan? Marrying Beer and Food. National Public Radio. June 24, 2007. <http://www.npr.org/templates/story/story.php?storyId=11264351>
- Wolaver's Certified Organic Ales. <www.wolavers.com> .
- Yellowstone Valley Brewing Company. <www.yellowstonevalleybrew.com>.
- Zukin, Sharon. 2004. *Point of Purchase: How Shopping Changed American Culture*. London: Routledge.

APPENDICES

APPENDIX ONE: DEFINITIONS OF BREWERY-RELATED TERMS

Craft Brewer: This term is used to describe all microbreweries, brewpubs, regional breweries, and contract brewers (that produce fewer than 15,000 barrels of beer annually) and that remain in accordance with the three requirements for the Brewers Association designation: 1) an output of fewer than two million barrels annually; 2) beers produced with a minimum of 50 percent malted barley; and 3) less than 25% of the brewery is controlled by another producer of alcoholic beverages that is not itself a craft brewer.

Microbrewer: In addition to meeting the components of the general craft brewer definition, this type of brewer sells a minimum of 50 percent of its product off-site. Additionally, the microbrewer produces fewer than 15,000 barrels of beer per year.

Brew Pub: Usually a restaurant and brewery under the same roof, a brew pub sells a minimum of 50 percent of its beer on site and adheres to the general definition of craft brewer. The total annual output of this brewery type does not exceed 15,000 barrels. The major difference between a brew pub and a microbrewer lies in how the beer is sold: on-site versus off-site.

Regional (Craft) Brewer: Breweries fitting into this category are similar to the microbrewery, with the major difference being size. Regional brewers produce between 15,000 and 2 million barrels of beer annually. Generally speaking, these breweries were previously microbreweries but have since outgrown the size limitations of the definition. Finally, like the brew pub and microbrewer, the regional (craft) brewer must also comply with the general definition of the craft brewer.

Contract (Craft) Brewer: This type of brewer produces beers for other craft breweries. A brewery can simultaneously be a contract brewer and another type of craft producer. The contract craft brewer adheres to the general requirements of craft brewing, while putting the label of another (distant) brewer on the product.

Mass Producer²³: Composed of both regional and national subsets, this type of brewer is not a producer of craft beer. The production methods and styles of beer produced by the mass producer set this category apart because of the type of beer brewed, and the way that it is created. While craft brewers use at least 50 percent malted barley in the brewing formula, the malted barley content in the beers of mass producers is much lower, leading to a much lighter lager beer. To fill the void created by the low barley content, mass producers generally use adjuncts in the brewing process such as corn and rice to create the lighter flavors.

²³ The term ‘mass producer’ is used interchangeably with ‘generalist producer’. The term ‘generalist producer’ is used in the thesis in conjunction with the distinctions of Resource Partitioning Theory between ‘specialist’ and ‘generalist’.

APPENDIX TWO: DEFINITION OF VARIABLES

Economy and Jobs: *Cities Ranked and Rated* draws this score from several characteristics related to a metropolitan area's respective present economic situation. The first consideration is income, and is an aggregate of 1) per capita income (2000 Census); 2) household income (2003); 3) income distribution; and 4) income growth (1990-2003). Secondly, employment is factored into the equation. The attributes that are considered in the scoring process are: 1) unemployment rates (August 2003); 2) recent job growth (August 2002-August 2003); 3) projected job growth; and 4) percentages of blue- and white-collar employees. The final consideration for this category is the largest employment industry.

Cost of Living: The cost of living index attributes include 1) indices and taxes; 2) housing; and necessities. Included in the indices and taxes category is the Cost of Living Index (Bureau of Labor Statistics) which gauges a specific area's performance with the national average. The Financial Progress Index (*Cities Ranked and Rated*) is a comparison between household incomes and cost of living. Lastly, tax rates of income, sales, and property are included in this portion of the calculation. The second consideration is housing, where median home price, home price appreciation are factored into the assessment of each metropolitan area. Finally, indices of necessities such food, housing, utilities, transportation, healthcare, and miscellaneous costs are drawn from the Bureau of Labor Statistics.

Climate: Three main considerations related to the annual weather patterns of an area make up the climate score. The first of these is temperature, in which average January low temperatures, average July high temperatures, the number of days above 90° F, and number of days below both 32° F and 0° F. Precipitation is addressed through categories of days of precipitation per year, annual inches of snowfall and rainfall, and annual days with greater than 0.5 inches of rain and 1.5 inches of snow. The subcategory of comforts and hazards employs statistics of relative humidity in July, annual days of mostly sunny weather, number of days with thunderstorms, and an area's risk scores of hurricanes and tornadoes.

Education: The three main foci of the education scores are educational achievement, quality of public schools, and higher education availability. The first of these is drawn from the United States Bureau of the Census, and includes the percentages of residents of each metropolitan area attaining a high school degree, two-year college degree, four-year college degree, and graduate/professional degrees. Secondly, the quality of an area's public schools are gauged from a particular location's expenditures per pupil, ratio of students to teachers, percentage of students attending public schools, and average SAT/ACT scores. Finally, the provision of higher education opportunities are measured by the number of two-year colleges and four-year colleges/universities. The other

component of the higher education measure is the number of highly ranked universities, with this information coming from *Princeton Review's* assessment of universities.

Health and Healthcare: This index is composed of data drawn from two sub-categories. The first of these, hazards and illnesses, considers several environmental factors that indicate potential hazards to the health of residents in a particular metropolitan area. These include air-quality scores, water-quality scores, pollen/allergy scores, stress, cancer mortality rates, and depression days per month. The numbers are drawn from both the Environmental Protection Agency and Centers for Disease Control. The second part of the category evaluates available healthcare services. The items included are physician/patient ratios, hospital beds per capita, the number of teaching hospitals, and average costs of medical-related expenses.

Crime: The crime score of each metropolitan area utilizes statistics from the United States Department of Justice's Federal Bureau of Investigation Uniform Crime Reports. Among the data considered in the crime scoring are violent crime rates, changes in violent crime rates (1996-2001), property crime rates, and changes in property crime rates (1996-2001).

Transportation: The transportation score is a measure of attributes related to both intercity and intra-city mobility characteristics. The first measure that is analyzed is commuting, in which the following variables are combined: 1) average commute times, 2) commutes by automobile, 3) commutes by mass transit, 4) those who work at home (telecommuters), and 5) mass transit miles per capita. The components of intercity transport services are the miles to the nearest major airport, type of local airport, number of daily airline departures, availability of Amtrak service, and the number of interstate highways present. Lastly, automotive costs are factored into the transportation score by utilizing annual insurance premiums, gas costs, and daily vehicle miles per capita as indicators.

Leisure: The leisure index is a compilation of the availability and proximity of several amenities to each metropolitan area. The first indicator used in the scoring is dining and shopping. This segment utilizes data from the rankings of an urban area's restaurant scene, the number of outlet malls, number of Starbucks, and the number of warehouse clubs. The entertainment portion of the leisure index uses several one-to-ten rating scales, of which professional sports, college sports, zoos and aquariums, amusement parks, and botanical gardens are considered. Lastly, the availability of a variety of outdoor activities is included in the composite. The areas covered in this portion are ratings for golf courses, ski areas, and national parks. Additionally, the total number of square miles of inland water and miles of coastline are taken into account.

Arts and Culture: Three specific areas are used in this composite of how well a metropolitan area performs in the area of arts and culture. The first area, media and libraries, is gauged based on the quality of arts radio (NPR-based, other classical and jazz music, and non-commercial talk radio), the number of public libraries, and the ratio of

library volumes per capita. The performing arts measure is calculated from the quality and availability of classical music, ballet/dance, professional theaters, and university arts programs. Finally, the museums portion of arts and culture is based on the overall quality of museums, rating of arts, sciences, and children's museum facilities.

Quality of Life: The most subjective of all measures from *Cities Ranked and Rated*, this measure attempts to quantify how inviting each metropolitan area is. The first of the three considerations for this index is the physical attractiveness of an urban environment. This is based on how well kept a city is and its ability to provide a general positive feel. Heritage is the second factor and is based on how well a city is able to stick to its roots, thus preserving physical and cultural heritage. Finally, overall ease of living considers qualitative measures such as attitudes, friendliness, as well as simplicity of infrastructure and crowdedness. Unlike the other scoring methods, the quality of life index is based on non-quantifiable information, as well as the authors' perceptions.

Tourism Dependence: This state-level figure is composed of the total amount spent on travel and tourism divided by the state's GDP. Additionally, this figure reveals information related to the level of a state's quality of life by indicating positive characteristics of places and their marketing to persons outside of the state.

Per Capita State Expenditures: This figure provides a comparison of the varying degrees of involvement that state governments' have on the social welfare of their respective states. This figure helps to separate states that emphasize "big government" versus those states that pursue a path of minimal government involvement.

Creativity Rank: This ranked order variable from *The Rise of the Creative Class* assesses the percentage of a metropolitan population that is employed in what Florida deems to be creative occupations. The number of persons employed in occupations such as arts, business ownership, science, engineering, architecture, design, and entertainment are included in this calculation. The percentages of persons employed in such occupations are then divided by the total population of the metropolitan area. The resulting ratios are then ranked accordingly. MSAs with higher percentages are given rankings closer to one, and higher rankings indicate lower percentages of creative-minded workers.

Talent Rank: This rank-order variable measures the degree of talent present within a metropolitan area. The method of evaluation for this ranking is a calculation of the percentage of persons present in an MSA who possess at least a bachelor's degree (based on 1990 *U.S. Census* data). The percentages are then ranked by MSA. Metropolitan areas with larger percentages of talented workers are given ranks closer to one, and areas with smaller percentages of such workers are associated with higher numbers (closer to 274).

Technology Rank: The ranking system for the technology measure is the product of two related indices. First, the percentage of a region's high-tech output compared to the total

high-tech output of the United States (i.e. how much does a particular MSA contribute to the nation's total output?). Secondly, the percentage of a region's high technology output is compared to the total economic output from within the region. The aggregate of these two scores are then ranked among metropolitan regions within the country. Areas with a higher score (i.e. greater percentages of high-tech output) have rankings closer to one, and areas that are lacking in their high-tech output receive higher scores.

Tolerance Rank: This ranking system attempts to differentiate metropolitan areas based on how accepting they are of phenomena outside of cultural norms. Included in this measure are scorings such as the "Gay Index", which evaluates how accepting areas are of homosexuality. MSAs that are more tolerant are ranked closer to one, and areas that have a lesser degree of tolerance of homosexuality and other non-mainstream cultural norms have higher numeric ranks.

Wage Inequality Rank: Metropolitan areas are assigned ranks based on the degree of wage gap present at the intrametropolitan level. The highest average wages are compared to the lowest average wages within an MSA. Areas that exhibit less of a wage gap receive ranks closer to one, and those metropolitan areas with greater degrees of economic inequality are associated with higher rank scores.

VITA

James Baginski grew up in western Pennsylvania, where he attended Indiana University of Pennsylvania (IUP). He obtained a Bachelor of Arts degree from the university's Department of Geography and Regional Planning. While a student there, James developed a passion for geography, largely due to the influences of Dr. Kevin Patrick. He received the department's Outstanding Undergraduate Student award, and graduated Summa Cum Laude in 2005.

While enrolled as a graduate student in The University of Tennessee's Department of Geography, James was advised by Dr. Thomas Bell. His coursework emphasized his strong interests in urban, economic, and transportation geographies. At the end of his first year of pursuing a Master of Science degree, James was awarded the department's Outstanding Teaching Assistant award for his performance in the classroom for World Regional Geography and Geography of Europe courses.

Following the completion of his first year of graduate studies, he was funded by a McClure Grant to conduct research in Wuhan, China after the completion of a field course entitled "Experiencing the Geography of China." James was the recipient of The Robert G. Long Outstanding Graduate Student award for the academic year 2007-08.