Neighborhood Change, One Pint at a Time: The Impact of Local Characteristics on Craft Breweries

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Abstract

Cities have recognized the local impact of small craft breweries, in many ways altering municipal codes to make it easier to establish breweries and making them the anchor points of economic development and revitalization. Nevertheless, we do not know the extent to which these strategies impacted changes at the neighborhood level across the nation. In this chapter, we examine the relationship between growth and locations of craft breweries and the incidence of neighborhood change across the United States. In the first part of the chapter, we rely on a unique dataset of geocoded brewery locations that tracks openings and closings from 2004 to the present. Using measures of neighborhood change often found in literature on gentrification-related topics, we develop statistical models relying on census tract demographic and employment data to determine the extent to which brewery locations are associated with social and demographic shifts since 2000. The strongest predictor of whether a craft brewery opened in 2013 or later in a neighborhood was the presence of a prior brewery. We do not find evidence entirely consistent with the common narrative of a link between gentrification and craft brewing, but we see a link between an influx of lower-to-middle income urban creatives and the introduction of a craft breweries. We advocate for urban planners to recognize the importance of craft breweries in neighborhood revitalization while also protecting residents from potential displacement.[1]

Introduction

Brooklyn Brewery occupies half a block along North 11th Street in the heart of Williamsburg, one of New York City's most rapidly changing neighborhoods. On most weekends, the tasting room is packed full of enthusiastic craft beer

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drinkers. Former industrial spaces nearby house gourmet restaurants, trendy bars, boutique hotels, and renovated residential lofts. Williamsburg was not always this way. Remnants of the area's industrial past are visible everywhere—large brick factory buildings fill entire city blocks and a still-active oil depot operates along the river inlet two blocks northwest of the brewery. Many consider Brooklyn Brewery to be the anchor institution of Williamsburg's revitalization, a popular narrative that, as we describe in this chapter, repeats itself with Wynkoop Brewing in Denver's LoDo neighborhood, 21st Amendment Brewery in San Francisco's SoMa neighborhood, and others across the country.

Shifting consumer preferences toward more flavor, more options, and more local products have fueled the growth of these three breweries and of craft beer in general. However, urban planning and policy have also influenced the success of craft brewing. Some cities have modified their zoning regulations and offered financial incentives that have allowed intrepid entrepreneurs to become first-movers into economically uncertain locations (Best 2015; Hopkins 2014). In turn, these anchor establishments helped spawn new, smaller craft breweries as the demand for high-quality local beer—and other niche products and services—has increased. Future growth of the craft beer industry is tied to the success of these new breweries. Upstart brewers tend to be small—often borne of a home brewing hobby—with the capacity and profit incentives to serve only a local market. Unlike the pioneering microbrewers before them that serve regional and multi-state consumers, these newer brewers—such as brewpubs that produce beer only for the customers who patronize their restaurants—require smaller production spaces and thus are not limited to locating in industrial neighborhoods. Seeking to capitalize on a new market of place-based consumers, newer and smaller brewers may not be *catalysts* of urban revitalization so much as *respondents* to changing neighborhood demographics.

In this chapter, we explore the influence of neighborhood change over the past decade on where craft breweries are located. This study is the first to empirically examine the relationship between neighborhoods and craft breweries across the United States. Using US Census data, we first describe the neighborhood characteristics of where craft breweries operate. We then look at neighborhoods to understand how changes in residential composition suggest factors influential in craft brewery location decisions. We also explore differences at regional and sub-regional spatial scales We conclude with some suggestions for urban planning and policy as other cities turn to craft brewing as an opportunity for neighborhood revitalization, economic development, and tourism.

Craft Beer: People, place, and planning

People and place

Although the demand for craft beer has increased rapidly over the past three decades, it has not grown uniformly across all demographic groups. Craft beer drinkers tend to have higher incomes than other beer drinkers, because on average craft beer commands a higher price than other domestic or import beers (Tremblay and Tremblay 2011). Furthermore, in the recent past, craft beer drinkers have tended to be white, male generation X-ers (Tremblay and Tremblay 2005), but current trends indicate an increasingly racially and ethnically diverse, female, and millennial demographic profile (Watson 2014).

Several researchers have explored the link between place, demographics, and the location of craft breweries. Three main threads link these studies. First, the spatial geography of craft beer production in the United States is uneven at multiple scales. At a regional level, for example, the Pacific Coast states have seen major increases in production volume and brewing facilities over the past three decades, while there has been very little growth in the number of facilities in the southeastern US over the same time period (McLaughlin, Reid, and Moore 2014). To some extent, this is a result of California's vanguard position in the rebirth of local brewing—many consider Anchor Steam in San Francisco, New Albion in Sonoma, and Sierra Nevada in Chico to be the modern founders of today's craft brewing industry (Acitelli 2013). At the state level, research has found a significant association between demographics and craft beer. Higher population predicts more craft beer production, but controlling for population, traditional brewing culture is a stronger predictor (McLaughlin, Reid, and Moore 2014). Higher educational attainment and greater levels of happiness and well-being may also be associated with the amount of craft brewing at the state level (Florida 2012).

Cultural attitudes and affinities associated with place may impact craft beer production and consumption in a metropolitan area. For example, the values of residents who have helped to "keep Portland weird" may have also contributed to the explosion of the craft beer industry in that city (Cortright 2002). On the other hand, religious convictions and corporate influence are significant predictors of the low number of craft breweries in the southern United States (Gohmann 2015). Metropolitan-level influences on craft beer also vary by region. Factors such as the cost of living and the level of tolerance the population has for activities outside of cultural norms are significant predictors of craft breweries' presence in the South. Education levels and the amount of arts and culture in the metropolitan area are not significant predictors in the South, even though they are in other regions (Baginski and Bell 2011).

A second thread of research on craft beer and place focuses on the idea of local production. Cultural geographers have used the term *neolocalism* to describe the

present-day phenomenon of the desire for the local: preferring the mom-and-pop shop on Main Street to the anonymity and sameness of the "big box" store (Flack 1997). Much as wine connoisseurs travel to wineries to experience the *terroir* of a vintner's product, or foodies look to experience local flavors in new restaurants or farmers markets, craft beer drinkers seek out the local connection between their favorite beverage and the place where it was brewed.

Many craft breweries tie into local landmarks and lore through their beer names and labels. This can help newcomers share in the cultural history of a place through consumption of a distinctively local product (Schnell and Reese 2003), creating a common narrative of a certain neighborhood history as new residents move in. For example, the Great Lakes Brewing Company, based in Cleveland, Ohio, brews Burning River Pale Ale, whose label pays tribute to the infamous 1969 Cuyahoga River fire as a symbol of the city's industrial past and modern rebirth (Stradling and Stradling 2008). Oakland's Linden Street Brewery ties into the local ethos by delivering its flagship product in kegs solely by bicycle to restaurants and bars in the city. The cargo bike that sits in front of its brewing facility serves as a visible symbol of local production and consumption, as well as its membership in the city's bicycle culture.

A third rationale for the connection between craft beer and place can be seen through the literature on gentrification. The term *gentrification* does not have a unique definition, but generally refers to the process of middle-class professionals moving to disinvested central city neighborhoods, upgrading housing, and attracting new businesses that cater to the new neighborhood clientele. Often, this process coincides with the displacement of current residents and businesses, who tend to be poorer and from racial and ethnic minority groups. Some have argued that as a result of America's post-industrial economy, the newly-enlarged occupational class of managers and technical professionals, usually considered the gentrifiers, has had a substantial impact on consumer tastes and housing preferences as they seek the culture and compactness of the central city (e.g. Lees, Slater, and Wyly 2008).

Some scholars have argued that in certain locations, the development of craft breweries can accelerate gentrification by playing on the industrial heritage of the past (such as old manufacturing sites), appealing to the "discerning" consumer class attracted to such amenities, and in turn anchoring subsequent development (Mathews and Picton 2014). In some respects, then, craft beer is entangled with the process of neighborhood change, and may be either a leading indicator (as a pioneer of reinvestment) or a lagging indicator (as a response to changing tastes and local culture) (e.g. Cortright 2002).

Urban planning and policy

Craft beer has become intertwined with city planning over the past decade for two related reasons. First, it is increasingly seen as an engine of local economic

development and neighborhood vitality. Second, for reasons articulated in the previous section, craft beer is readily identified with its place of origin and attracts well-educated, affluent consumers. As a result, civic leaders and city planners increasingly look to the craft beer industry to play a role in neighborhood revitalization (cf. Hackworth and Smith 2001). Efforts to revitalize once-declining inner cities have emphasized the importance of the "creative class" and their demands in shaping reinvestment. Some have argued that because creative professionals drive the new economy, cities that wish to improve their economic performance should invest in the amenities that attract this class of people (Florida 2002)—museums, cultural activities, and perhaps craft beer.

Craft breweries are common first-movers into economically-depressed neighborhoods often out of necessity. Larger breweries require expensive equipment and ample space. Inexpensive rent is essential to keep overhead costs low for this type of entrepreneurial light industry, much as Jane Jacobs ([1961] 1992) noted in her praise of aged buildings. Breweries may also produce unpleasant noise, odors, and considerable wastewater pollution, making them less likely to obtain permits in bedroom suburbs or upscale shopping centers. Nevertheless, with its large equipment and high fixed costs, a new brewery signals that someone is starting to invest long-term in a place, more so than does a bar or restaurant. Smaller breweries may then follow. In turn, services move in, young families begin to settle, a community grows, and craft breweries become the canary in the coal mine for neighborhood change.

Significant anecdotal evidence suggests that this pattern is common. The 21st Amendment brewery in San Francisco is sometimes considered the "granddaddy" of the South of Market neighborhood (Associated Press 2013b), which is rapidly changing as a result of the region's technology sector. The city of Oakland, California's senior economic development specialist has argued that breweries revitalize struggling neighborhoods by serving as a magnet for new businesses while creating foot traffic and social activity (Somerville 2013).

Accordingly, city planners have recently begun to play an active role in fostering brewery openings and the inchoate neighborhood revitalization that trails them. Great Lakes Brewing opened in Cleveland's economically-depressed Ohio City neighborhood in 1988. When it started attracting customers and other shops began to open nearby, the city repaved surrounding streets with cobblestones and invested millions of dollars in the redevelopment of a neighboring abandoned historic market hall (Associated Press 2013b). On the West Coast, Portland, Oregon's development commission assists craft breweries with building renovations (Best 2015). Since 2000, Portland has spent $96 million on revitalization efforts in its Lents neighborhood, recently dedicating $1 million to building improvements and loans for a new brewpub (Boddie 2014).

City planners also play a role through permitting and land use regulation. Craft breweries' amalgam of industrial and retail uses often necessitates special zoning, infrastructure, and government assistance (Perritt 2013). Some cities, including San Diego, Long Beach, Dallas, Charlotte, and Cincinnati, have

introduced specific microbrewery land use or more mixed-use designations to simplify development (City of San Diego 2015; Appleton 2012; Peters and Szczepaniak 2013; May and Monk 2015). The San Francisco Brewers' Guild recently stated that the biggest challenge facing their brewers was the long delay in acquiring permits from the Department of Building Inspection, due to a permitting logjam from the city's construction boom (Crowell 2013).

Today, many craft brewers explicitly view themselves as agents of neighborhood revitalization and change (e.g., Bartlett et al. 2013; Flynn et al. 2014). In 1989, Boulevard Brewing opened in central Kansas City, Missouri. Rather than locating on inexpensive land at the urban periphery, the brewers wanted to contribute to the central city's urban vitality, referring to themselves as "committed urbanists" (Associated Press 2013a). However, urban breweries like Boulevard may sometimes become victims of their own success; the ensuing desire to be in the neighborhood can increase local rents and demand for space. Marquee breweries such as 21st Amendment and Brooklyn Brewery have begun to expand and relocate to less-expensive neighborhoods in their metropolitan areas (Associated Press 2013b; Li 2014), perhaps restarting the cycle of neighborhood change elsewhere, anew.

The news media, case studies, and development reports provide many of the details behind the effects of craft breweries and the economic transitions of neighborhoods in which they are located. In summary, craft brewing is good for cities by investing in struggling neighborhoods and adding an amenity to changing neighborhoods, and planners are willing to accommodate these new investments. Much of the information on a sub-metropolitan scale relies on anecdotal evidence or single case studies. There is little empirical evidence from these studies or others that assess the relationships between residential characteristics of neighborhoods and craft breweries.

Methods and Data

Craft brewing is related to neighborhood change and urban planning, but the nature of this relationship remains vague in the research literature. To address this, we explored the extent to which the changing residential characteristics of neighborhoods influence the location of new breweries. In other words, does urban revitalization predict the locations of these desirable assets? Given the cross-sectional nature of our dataset, it is not possible to assign a direction of causality to the relationship between craft brewery locations and neighborhood change—and, in fact, there may be a reciprocal relationship. Nevertheless, understanding associations between craft brewing and neighborhood change has policy implications, such as whether cities should create incentives for breweries to locate in disinvested neighborhoods if demographic changes encourage them to locate in revitalized neighborhoods otherwise.

Craft brewery locations

To understand the relationship between craft brewing and location, we obtained a unique dataset of craft breweries in the United States from PubQuest (2015), a company that maps craft breweries.[2] PubQuest compiles the brewery data from a variety of public and private sources and includes each US craft brewery location open to the public, the address, and the type of brewery. Brewery types include brewery with tasting room, brewpub with on-site brewing and food service, and brew houses that are owned by craft breweries without on-site brewing. The dataset includes all craft breweries that were in operation at some time between 2006 and 2015. The dataset does not include production volume, though all breweries listed meet the Brewers Association definition of a craft brewer.

We aggregated the PubQuest data to the census tract level to harmonize with US Census socioeconomic variables. Census tracts are an imperfect spatial unit and may miss more localized relationships between neighborhood change and craft brewery locations. Nevertheless, they provide a consistent level of geography across the United States and are relatively stable over time (though see discussion below). Socioeconomic data are more reliable at the census tract level than at smaller spatial units, such as block groups. Thus, we defined neighborhoods using the census tract as the spatial unit.

Identifying neighborhood change

We measured change between the 2000 decennial Census and the 2009–2013 five-year American Community Survey (ACS) estimates. The ACS aggregates survey responses from each year of the five-year period into one dataset, so it allows for a rough comparison of 2000 and 2011 socioeconomic data. Literature on gentrification and displacement provided a starting point for variables appropriate to measure when trying to understand neighborhood change (e.g. Freeman 2005; Newman and Wyly 2006). We selected variables on race and ethnicity, age, family structure, educational attainment, income, employment, housing age, median home value, and population density as independent variables. All dollar amounts are inflation-adjusted 2013 dollars.

Although we are primarily interested in how change in these variables is associated with craft brewery locations, we also included year 2000 values for each variable for which we examined change. In this way, we controlled for locations that may have experienced little change but had high or low values of each variable to begin with. We standardized census tract definitions to the 2010 boundaries, using the Brown University Longitudinal Tract Database files (Logan, Xu, and Stults 2014). We only included variables in our models that are strictly comparable between the two datasets.

[2]The third author of this paper is the co-founder of PubQuest.

We estimated a series of logistic regression models, in which the dependent variable is whether a census tract has a new craft brewery. We estimated both standard and robust versions of the models. We defined "new" to mean whether a brewery opened in 2013 or later. In each model, we controlled for whether a craft brewery existed prior to 2013. Particularly in the early years of the craft brewing renaissance, brewers relied on existing knowledge of those who came before them in the industry (Ogle 2006; Acitelli 2013), so we expected to see a positive relationship between the presence of an older brewery and a new one. We also controlled for the census division in which the tract is located, as defined by the US Census Bureau (2000). As we described earlier, existing research has shown an uneven geographic distribution of craft beer, with far greater prevalence in the western US and far less prevalence in the southeastern portion of the country (Baginski and Bell 2011; McLaughlin, Reid, and Moore 2014; Grohmann 2015). Independent variables in the models are cross-sectional and paired together: one member of the pair measures change over time while the other measures the value in the base year.

Craft Beer and Neighborhood Change

Descriptive statistics

As of March 2015, 4,044 craft brewery locations as we defined them were in operation in the United States, approximately half of which (2,036) had opened in 2013 or later. The Pacific census division has the most craft breweries with 884, while the East South Central division, which includes Alabama, Kentucky, Mississippi, and Tennessee, has the fewest with 73 (Figures 1 and 2). Most of the Pacific's breweries are in California, which has more than twice the number of craft breweries compared to the next largest concentration in Colorado. Several states outside the West, including Michigan, New York, and Pennsylvania, also have a significant number of breweries. Breweries are not clustered at the neighborhood level across the US—fewer than 4% of census tracts had one or more breweries, and 88% of those had only one. However, over 90% of census tracts with craft breweries are in urbanized areas or urban clusters as defined by the Census Bureau, which means that almost all breweries are near concentrations of at least 2,500 people.

Mean values for several demographic, housing, and employment variables using 2009–2013 ACS estimates are shown in Table 1, categorized according to whether the census tract had at least one craft brewery location in 2015. Neighborhoods with craft breweries are about two-thirds as dense as those without (equivalent to densities of many inner-ring suburbs). Those neighborhoods tend to have more white residents, a higher proportion of people in the 25–34 year age range, fewer households with children, more education, a slightly lower median income, a higher proportion of people in professional or technical occupations, more new

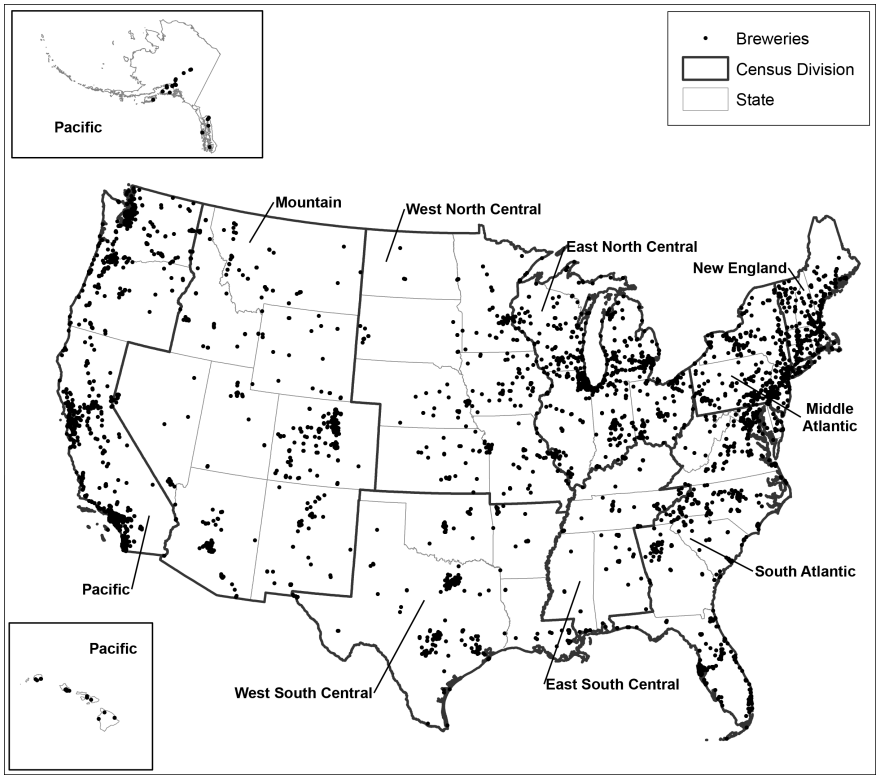

Figure 1: Craft breweries are predominately located west of the Rocky Mountains. There are a significant number of craft breweries in metropolitan areas of the Midwest and Northeast. Far fewer are located in the southern United States. Labels indicate census divisions. Data sources: PubQuest (2015), US Census Bureau (2000).

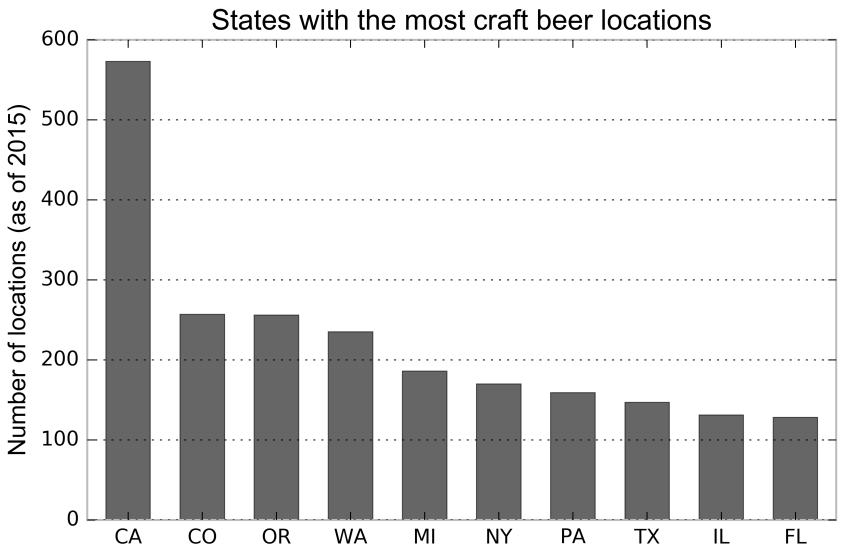

Figure 2: Craft brewery locations by state. In March 2015, California had 573 operating craft breweries, more than double that of the next state, Colorado. Even though the western US dominates craft brewing, six of the top ten states with the most craft breweries are in the eastern and southern US. Data source: PubQuest (2015).

housing, and higher housing prices.

Table 1: Mean values per census tract

	With craft brewery	Without craft brewery
Population density (sq. mi.)	3,604	5,377
Non-Hispanic White	71%	63%
Black/African American	8%	14%
Hispanic/Latino	13%	16%
Age 24 or younger	32%	33%
Age 25-34	16%	13%
Age 35-44	*13%*	*13%*
Age 45-54	14%	14%
Age 55-64	*12%*	*12%*
Age 65 or older	14%	14%
Households with children	27%	33%
Earned bachelor's degree	34%	27%
Median income (2013$)	$54,585	$56,834
Employed	90%	90%
Professional occupations	62%	59%
Housing built since 2000	15%	13%
Median housing age (yrs)	43	42
Median house price (2013$)	$250,046	$217,988

Note: All differences significant at 95% confidence interval except those in italics. Data source: 2009-2013 5-year ACS estimates.

The effects of neighborhood change on new breweries

Analytical results are shown in Table 2. Coefficients and significance levels in both the standard and robust versions of the models were similar and so their interpretations did not change substantially. Thus, we show only the standard model estimates. Values in the table represent odds ratios; that is, the odds that there is a new brewery in the tract compared to the odds that there is not, given the presence of the variable. Each of the first three models tests the influence of a different set of indicators on the location of new craft breweries.

The first model tests the influence of racial and ethnic categories. Breweries were more likely to locate in census tracts that lost racial and ethnic diversity over the decade we examined. Taken together, higher proportions of each of the racial and ethnic groups in the year 2000 were statistically significantly associated with a brewery opening. However, declines in the black and Latino populations between 2000 and the 2009–2013 ACS estimate predicts greater odds of a new craft brewing location. For each percentage point decline in the black and Latino populations, breweries were about three percent more likely to open.

Model 2 tests the relationship between other socioeconomic indicators and craft breweries. The results give some credence to the idea that breweries are locating in places where they can cater to a younger urban professional crowd. An increase in the 25-to-34 year old population and the proportion of older residents is positively associated with craft brewery locations. Fewer households without children in 2000 is also statistically significant. Both high levels of college-educated residents and increases in the proportion of people with college degrees predict the opening of a brewery, while the relationship is the inverse for income level. We hypothesized that craft brewing would appeal to a professionally-employed population. However, change in this occupational classification is statistically insignificant. Lower proportions of residents who were professionally employed in 2000 are associated with presence of neighborhood breweries.

The third model tests the influence of housing factors on craft brewery locations, primarily as a proxy for urban growth and change. We find that areas with a higher proportion of new housing stock in 2000, an increasing proportion of newly-built housing, and a decline in the median housing age predict craft brewing. At the same time, each year older the median housing age is in the census tract, the odds of a new craft brewery location increase by about 3.6%. The model indicates that census tracts with higher home values are likely to have breweries, although the change in home values is insignificant. We suspect this could mean that breweries are locating in census tracts with more infill development rather than those with expansive growth, indicating brewers' preferences for urban or central locations rather than outlying locations.

Model 4 tests the simultaneous influence of all three categories on craft brewery openings. To reduce issues of multicollinearity, we removed variables with variance inflation factors greater than 7. Most of the variables from the first three models remain significant, with a few notable differences. The black population in a census tract is no longer a significant predictor of breweries, though an increase in the white population becomes significant. Lower median incomes in a neighborhood have stronger effects on a brewery opening compared to the models that do not control for race and housing variables.

In all model specifications, we controlled for whether the census tract had a craft brewery prior to 2013, the population density of the census tract, and the geographic region of the country. The effect of a previous brewery is strong: the odds of a new craft brewery opening in a census tract are 2.8 times greater if there had been one prior, when controlling for all other characteristics. The result suggests older breweries act as catalysts for new breweries to co-locate. Population density has a small but negative relationship with brewery locations: adding one hundred additional people per square mile reduces the odds of a new brewery by about one percent. Consistent with other research (Baginski and Bell 2011), we found that the odds are significantly higher for breweries to open in the western US and significantly lower in the southern US.

Table 2: Logistic regression models of neighborhood change impacts on breweries.

	(1) Race/ethnicity	(2) Other SES	(3) Housing	(4) Full model	(5) West Coast
Non-Hispanic White (%)	1.017***			1.010***	1.012**
	(1.010, 1.025)			(1.006, 1.014)	(1.001, 1.023)
Change in non-Hispanic White (pp)	1.001			1.013***	1.011
	(0.990, 1.012)			(1.005, 1.021)	(0.991, 1.032)
Black/African American (%)	1.012***				
	(1.005, 1.020)				
Change in Black/African American (pp)	0.970***				
	(0.957, 0.983)				
Hispanic or Latino (%)	1.013***			1.013***	1.012*
	(1.006, 1.021)			(1.008, 1.018)	(1.000, 1.026)
Change in Hispanic or Latino (pp)	0.977***			1.010*	1.005
	(0.965, 0.989)			(0.999, 1.020)	(0.983, 1.028)
Age 25 or younger (%)		1.000			
		(0.989, 1.012)			
Change in age 25 or younger (pp)		0.997			
		(0.981, 1.013)			

	(1) Race/ethnicity	(2) Other SES	(3) Housing	(4) Full model	(5) West Coast
Age 25-34 (%)		0.998		0.995	1.037**
		(0.982, 1.014)		(0.980, 1.010)	(1.001, 1.075)
Change in age 25-34 (pp)		1.019**		1.031***	1.006
		(1.000, 1.038)		(1.013, 1.050)	(0.965, 1.050)
Age 35-44 (%)		1.088***		1.107***	1.071**
		(1.057, 1.121)		(1.081, 1.134)	(1.016, 1.129)
Change in age 35-44 (pp)		0.925***		0.914***	0.951*
		(0.898, 0.952)		(0.894, 0.936)	(0.903, 1.002)
Age 45-54 (%)		1.036**			
		(1.003, 1.070)			
Change in age 45-54 (pp)		0.963**			
		(0.932, 0.995)			
Age 55-64 (%)		0.873***		0.888***	0.921**
		(0.836, 0.912)		(0.864, 0.914)	(0.860, 0.987)
Change in age 55-64 (pp)		1.136***		1.124***	1.103***
		(1.093, 1.180)		(1.090, 1.159)	(1.024, 1.189)
Households with children (%)		0.953***		0.956***	0.955***

	(1) Race/ethnicity	(2) Other SES	(3) Housing	(4) Full model	(5) West Coast
		(0.945, 0.961)		(0.948, 0.964)	(0.935, 0.974)
Change in household with children (pp)		0.994		0.994	1.004
		(0.985, 1.003)		(0.985, 1.003)	(0.984, 1.025)
Earned bachelors (%)		1.026***		1.022***	1.014
		(1.019, 1.033)		(1.015, 1.029)	(0.996, 1.032)
Change in earned bachelors (pp)		1.030***		1.026***	1.021**
		(1.022, 1.039)		(1.017, 1.035)	(1.000, 1.043)
Log of median income (2013$)		0.426***		0.293***	0.404**
		(0.332, 0.546)		(0.218, 0.394)	(0.196, 0.828)
Change in median income (%)		0.994***		0.992***	0.988***
		(0.991, 0.996)		(0.990, 0.995)	(0.981, 0.995)
Employed (%)		1.011		0.999	1.060***
		(0.998, 1.024)		(0.984, 1.015)	(1.021, 1.102)
Change in employed (pp)		1.013**		1.004	1.030**
		(1.002, 1.024)		(0.993, 1.016)	(1.003, 1.058)
Professional occupations (%)		0.974***		0.979***	0.960***
		(0.966, 0.983)		(0.971, 0.988)	(0.939, 0.981)

	(1) Race/ethnicity	(2) Other SES	(3) Housing	(4) Full model	(5) West Coast
Change in professional occupations (pp)		1.002		1.000	1.009
		(0.994, 1.009)		(0.992, 1.008)	(0.992, 1.027)
Housing built in last 10 years (%)			1.020***	1.013***	1.008
			(1.015, 1.025)	(1.007, 1.018)	(0.995, 1.021)
Change in housing built in last 10 years (pp)			1.011***	1.005**	0.997
			(1.007, 1.016)	(1.000, 1.010)	(0.985, 1.008)
Median housing age (yrs)			1.036***	1.014***	1.004
			(1.031, 1.042)	(1.008, 1.019)	(0.990, 1.017)
Change in median housing age (%)			0.999*	1.000	0.999
			(0.998, 1.000)	(0.998, 1.001)	(0.995, 1.001)
Log of median home value (2013$)			1.152***	1.570***	1.251
			(1.052, 1.261)	(1.323, 1.865)	(0.883, 1.786)
Change in median home value (%)			1.003	1.006*	1.008
			(0.991, 1.008)	(0.999, 1.012)	(0.993, 1.017)
Brewery before 2013 (1 = yes)	5.754***	3.020***	5.265***	2.790***	3.317***
	(4.977, 6.632)	(2.578, 3.527)	(4.540, 6.085)	(2.373, 3.268)	(2.490, 4.386)
Population density (sq. mi.)	1.000***	1.000***	1.000***	1.000***	1.000***
	(1.000, 1.000)	(1.000, 1.000)	(1.000, 1.000)	(1.000, 1.000)	(1.000, 1.000)

	(1) Race/ethnicity	(2) Other SES	(3) Housing	(4) Full model	(5) West Coast
Mid Atlantic	0.594***	0.696***	0.606***	0.769**	
	(0.473, 0.747)	(0.553, 0.876)	(0.482, 0.762)	(0.609, 0.972)	
South Atlantic	0.574***	0.502***	0.752**	0.646***	
	(0.464, 0.712)	(0.405, 0.624)	(0.604, 0.940)	(0.513, 0.816)	
East North Central	0.818*	0.800**	0.864	0.894	
	(0.670, 1.003)	(0.652, 0.985)	(0.705, 1.064)	(0.726, 1.107)	
East South Central	0.307***	0.249***	0.410***	0.321***	
	(0.219, 0.424)	(0.176, 0.347)	(0.289, 0.572)	(0.225, 0.452)	
West North Central	0.644***	0.558***	0.687***	0.660***	
	(0.505, 0.821)	(0.435, 0.716)	(0.535, 0.883)	(0.510, 0.853)	
West South Central	0.415***	0.361***	0.492***	0.460***	
	(0.319, 0.540)	(0.275, 0.471)	(0.372, 0.648)	(0.343, 0.614)	
Mountain	1.255**	1.201	1.624***	1.206	
	(1.009, 1.566)	(0.962, 1.504)	(1.294, 2.044)	(0.952, 1.533)	
Pacific	1.291**	1.349***	1.396***	1.350***	
	(1.047, 1.598)	(1.101, 1.661)	(1.141, 1.717)	(1.089, 1.680)	
Observations	72,815	72,518	71,205	71,204	9,980

	(1) Race/ethnicity	(2) Other SES	(3) Housing	(4) Full model	(5) West Coast
Log Likelihood	−8,114.107	−7,682.520	−7,928.172	−7,518.136	−1,371.342
Akaike Inf. Crit.	16,262.210	15,427.040	15,890.340	15,110.270	2,800.683

Note: *p<0.1; **p<0.05; ***p<0.01

pp = percentage points. Values in parentheses are 95% confidence intervals. Models 1-4 use nationwide data, model 5 is the West Coast model.

A closer look: Brewing on the West Coast

Because of the distinctive regional variation in craft brewing locations and the role of pioneers in the western United States in establishing the new craft brewing movement, we re-estimated our national model for California, Oregon, and Washington. These three states contain about a quarter of all craft breweries in the US. We expected that, in addition to its unique history with respect to the craft brewing movement, relatively higher living costs compared to the rest of the country might change some of the relationships between neighborhoods and breweries. Results are shown in Table 2 as model 5.

Fewer relationships are significant in the regional model compared to the national model. An increase in the proportion of people aged 55–64 and people employed predict new breweries in a neighborhood. Curiously, in both the West Coast model and the national model, an increase in the number of bachelor's degrees and a decrease in median income are associated with new brewery openings. We discuss this paradoxical finding further in the discussion. Additionally, as in the national model, the presence of an older brewery remains a significant predictor of whether a new one opened in the previous two years. The results suggest a smaller influence on neighborhood change factors in craft brewing locations along the West Coast. It is possible that new craft breweries are unable to open in significantly changing residential areas because of other development pressures.

Discussion and Conclusion

Today's wave of urban revitalization efforts has been viewed by supporters as a way to increase a city's wealth and economic opportunities. Detractors, however, consider it gentrification with better marketing. There has been considerable anecdotal evidence that craft breweries are harbingers and even instigators of neighborhood change. Many cities today pursue craft breweries as potential job creators, catalysts for investment and development, and tourist attractors. Craft beer consumption is associated with higher socioeconomic indicators such as race, income, and education, (Tremblay and Tremblay 2005; Tremblay and Tremblay 2011; Florida 2012) and, at larger spatial scales, population growth and diversification (Schnell and Reese 2014). This study is unique in that we looked at neighborhood-level characteristics, which better reflect the character of small craft brewers than regional- or state-level analyses can.

At a neighborhood level, we find a slightly different story than that told by previous researchers. Our data do not allow us to conclude that new craft breweries cause changes in neighborhood indicators, but we can see how they follow change. Our results are not entirely consistent with the story of gentrification in neighborhoods; changes in racial composition do not seem to be a draw for new craft breweries, nor do so-called "creative class" occupations. On the other hand, areas that have a highly educated population, increasing

education levels, lower and declining income levels, and an older but developing housing stock do appear to welcome craft brewing to the neighborhood. Perhaps we might speak of a link between craft beer and what one writer has recently called "yuccies"—young, urban creatives, who may not fit in the standard US Census employment categories (Infante 2015). These changes also depend on the region, so influences in one may not necessarily be significant in another. Our informal survey with 15 brewery owners tentatively confirms these findings. They uniformly stated that neighborhood character was very important or even the primary reason for their location choice. Many referred to themselves explicitly as pioneers and catalysts in neglected historic neighborhoods.

If craft breweries and brewpubs are paths to coveted neighborhood revitalization, planners must keep several things in mind. First, simplifying the permitting process and creating dedicated craft brewery land use designations can reduce some of the bureaucratic obstacles to the development of breweries. Such cities and neighborhoods thus become more attractive. Second, coordinating revitalization efforts and subsidies with potential breweries can create synergies in the improvement of neighborhood infrastructure. Renovating buildings and improving streets and sidewalks can maximize the effect of surrounding economic development.

Future research may help strengthen some of these conclusions. For example, we expect employment-side factors and planning regulations to influence the locations of new craft breweries, there is no nationwide dataset that would allow us to include those factors in our analysis at the census tract level. For that reason, we only investigated the influence of residential patterns on brewing locations and leave investigations that include these factors at the subregional level for future work. We also suspect that the effect of changes may be different for different brewery types, but we leave this analysis for future work as well. Finally, controlling for metropolitan differences in housing costs might clarify the relationship between housing values and investment and craft brewery locations.

City planners are also agents of neighborhood change and bear a responsibility to current residents to represent their interests. Simply allowing rents to rise as trendy businesses and affluent residents arrive is not a good faith effort to represent the needs of longtime residents. Rather, diverse and inclusive collaboration among all impacted stakeholders is critical for equitable planning. How can local culture and history be preserved while increasing economic opportunity and amenities for all? Displacement of longtime residents is a key challenge facing economic revitalization of disinvested neighborhoods. If craft beer is a canary in the coal mine for neighborhood change, perhaps it can also be a trigger for proactive planning interventions, harnessing the image of the "local" to ensure people who made the history in the images can remain in their place on the bar stool.

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