Oklahoma Craft Brewing Economic Impact Report

Prepared by

Travis Roach, Ph.D.
Department of Economics, College of Business
University of Central Oklahoma[1]

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[1] Contact Information: (a) 100 N University Dr., Edmond, OK 73034 (w) www.travisroach.com (e) troach2@uco.edu (p) (405) 974-2934

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1. Executive Summary

The national trend towards increased craft beer consumption has resulted in a veritable increase of economic activity that is directly attributable to craft brewers. At the national level, the craft brewing industry generated $55.7 billion dollars in economic activity and more than 424,000 jobs in 2014. While this growth in craft brewing has certainly taken root in Oklahoma, the full potential of this industry remains untapped.

Even though the Oklahoma Craft Brewing (OKCB) industry is still in its nascent stages, the industry has already had a tremendous economic impact for the state. In 2014 alone the OKCB industry had a $415.7 million dollar economic impact by stimulating employment growth within the craft beer industry and supporting industries (such as restaurants, bars, bottling and distribution, etc.). On a per barrel basis, each barrel of craft beer produced by Oklahoman breweries in 2014 had a $16,353 impact and each twelve ounce pour of craft beer had a $65.94 impact.

In 2014, the OKCB industry had the 33rd highest economic impact in the United States despite being 47th in total craft beer production. A major reason that the OKCB has had such a large economic impact relative to the amount of craft beer produced is due to the impressive amount of employment and competitive wages in the OKCB industry. Total income for Oklahoma Craft Brewers in 2014 amounted to $128.3 million, which accounts for 30.8% of the total economic impact. The average pay per employee in 2014 was $49,870. This compensation ranks 6th nationally – only behind New York, Washington D.C., Alaska, Minnesota, and New Jersey. The average income of OKCB employees is thus higher than employees in California, Pennsylvania, and Texas, which have well-cultivated craft brewing industries.

While the early success of the OKCB is noteworthy, the growth potential for the OKCB industry has not been fully realized because this growth has occurred in a state with restrictive alcohol laws relative to the rest of the United States. In a survey of OKCB firms, the median reported production growth for 2015 was 51%. The minimum reported 2015 growth was 11% while other companies expressed triple digit growth. If the OKCB industry did indeed grow by 51%, the economic impact of the OKCB industry in 2015 was approximately $469.4 million. This represents a 12.9% larger economic impact than the year prior.

2. Introduction

In the last decade, the country has seen enormous growth and popularization of local, artisanal "craft brewing." This nationwide trend has resulted in over 20 million barrels produced by regional breweries, microbreweries, and brewpubs. These breweries had a $55.7 billion economic impact, and created 424,000 jobs nationwide.

The state of Oklahoma has already benefited from the grassroots growth that is typical of the craft brewing industry. The state is currently home to 17 craft breweries with more brewers in preparation

to begin serving the Oklahoma craft beer market. In 2014 alone, ten of these Oklahoma breweries generated over $415.7 million in economic activity. This large economic impact occurred despite restrictive alcohol laws showing just how robust the OKCB industry is.

In this report, I highlight and contextualize the economic impact that the OKCB industry has had thus far in Oklahoma, and discuss potential economic gains that could accrue under various growth prospects should existing laws be amended. While the budding OKCB industry has grown from its early roots, the existence of some state-level alcohol policies thwart future growth prospects. Thus, I present a number of estimates for growth in economic impact and tax revenue to estimate the benefits that the OKCB could have on the Oklahoma economy should these policies be relaxed or repealed.

3. Methodology

A recent publication by the Brewers Association closely examined the economic impact of craft brewing at the state-level for all fifty states and the Washington D.C. area in 2014. This analysis is exhaustive and explores the multiple avenues through which craft brewing can effect a state's economy along the supply chain. Along with the direct economic impact effects from the craft brewing industry – wages and tax revenues, for example – this study was also able to measure any indirect effects due to the craft brewing industry – increased sales and employment in the restaurant and bar industry, agricultural production, or distribution services, among others.

Due to the comprehensive and up-to-date nature of the Brewers Association study I will present many of these results here with further contextualization and comparative analysis. Additionally, I present a number of tests and scenarios that estimate the potential economic impact the Oklahoma craft brewing industry would have if existing laws were changed which would all the industry to become more robust and add production. Thus, the goal of this report is not only to analyze and present the economic impact of the Oklahoma craft brewing industry, but to also discuss the potential impacts that this industry could have on the Oklahoma economy should current policies and state laws be adapted to allow for expansion and growth in the industry.

My report includes a discussion of the laws that impact Oklahoma craft beer distribution and consumption, and an analysis of the Oklahoma craft brewing industry using economic impact statistics from the Brewer's Association. Beyond this, I contribute the following new information and analysis of the Oklahoma craft brewing industry (OKCB):

- A comparative analysis of the OKCB industry impact with states that have a similar population to Oklahoma. I choose a sub-sample of states that are within a window of one million people.

- A projection of what the economic impact of OKCB industry would be if production levels were to grow by 10%, 25%, or 50%. For this inquiry I use a regression analysis with data from all 50 states and Washington D.C. on: craft brewing production levels, the state's employment

to population ratio, population, and the wholesale excise tax rate on strong beer production. I will note here that the various growth scenarios I use going forward are conservative. In 2015, many brewers that I surveyed increased production by much more than the top growth scenario of 50%.

- A breakdown of the taxes that are generated by the Oklahoma craft brewing industry at the wholesale and retail levels, and a forecast of tax revenues assuming the above various growth prospects (10%, 25%, and 50%).

3.1 Definitions

Ad-valorem Tax – A tax that is determined by the value or price of an item. For example, a 10% ad valorem tax on an item that is $100 results in $10 of tax revenue while a 10% ad valorem tax on an item that is $50 results in $5 of tax revenue.

Excise Tax – A tax that is determined by the quantity of a good produced, not the price. For example, if there is an excise tax of $0.40 cents per unit and 100 units are consumed, then $40 of tax revenue will be generated. This amount of tax will be collected regardless of the price of the item.

BBls – Volume abbreviation for barrels. A barrel of beer is 31 gallons, and a keg is typically half a barrel.

4. Relevant Policies

Oklahoma was granted statehood in 1907 as a dry state. Since then, Oklahoma beer laws have remained rather restrictive relative to other states with the last substantive change occurring nearly sixty years ago in 1959.

The OKCB industry is impacted by policies that govern both the production and the distribution of their product. These policies include wholesale taxation, retail taxation, and limitations on the locations that traditional craft beer can be sold. Each policy if discussed separately below.

"Strong beer" in the state of Oklahoma is any beer that has more than 3.2% alcohol by weight (ABW).[2] This product definition matters for the relevant wholesale taxation rate and the venue in which the beer can be sold. Strong beer is taxed at $0.40 per gallon at the wholesale level while lower alcohol beers (3.2%) have a tax rate of $0.36 per gallon. The strong beer tax rate is the 15th highest in the country.

[2] Beers that are 3.2% ABW are 4% alcohol by volume (ABV)

Approximately 97% of OKCB production is strong beer. This is due to the production process that is necessary to brew India Pale Ales (IPAs), stouts, and other varieties of beer that have become widespread with the recent surge in craft beer popularity.

At the retail level, craft beer faces an ad valorem tax that differs depending on the location of sale. Craft beer sales from liquor stores have an 8.35% sales tax, and craft beer sales at locations that allow on-premise consumption have a 13.5% sales tax.

The main policy disincentive that effects craft beer production and sales is the restriction that strong beer cannot be sold alongside 3.2% beers in gas stations, markets, or grocery stores. This policy has relegated craft beer sales to restaurants, bars, brewpubs, and other locations that allow on-premise consumption. In my survey of Oklahoma brewers, companies indicated that an average of 63.6% of all production is sold to restaurants and bars, and 36.4% is sold to liquor stores.

It is beyond the scope of this report to discuss the societal impact that Oklahoma alcohol laws have in terms of mortality, vehicle incidents, or substitution to other inebriants (among other potential societal impacts). A note covering recent economic research on the subject, though, may aid policy makers and the public when discussing the above mentioned policies. Fernandez, et al. (2016) find that dry counties have a higher percentage of meth lab seizures, and that states could reduce meth lab seizures by up to 30 percent if all counties were "wet" (also in discussed in The Economist, October 2015 cited below). In the Journal of Health Economics, Baughman, et al. (2001) study Texas county-level data to discuss variance in vehicle accidents. The authors find that, "the sale of alcohol, especially beer and wine, appears to have a negligible if not negative effect on the number of alcohol-related accidents. Second, the sale of higher alcohol-content liquor may present a greater risk to highway safety than the sale of beer and wine" (Baughman, et al. 2001).

5. Economic Impact

This sections reports on the economic impact of the Oklahoma craft brewing (OKCB) industry. Included in this section is (i) a summary of direct and indirect effects from the craft brewing industry as calculated by the Brewer's Association, (ii) a national comparison of the OKCB industry with other similar-sized states, (iii) a discussion of potential growth paths for the craft brewing industry and what such an increase would amount to in terms of economic impact, (iv) a break-down of the tax revenues that the OKCB industry is responsible for, (v) and a forecast of tax revenues under various industry growth prospects.

5.1 Total Impact, Employment, and Wages

The Oklahoma craft brewing industry is quite small relative to the rest of the United States. In 2014, there were a total 10 craft breweries in operation.[3] This small amount of companies ranks as 47th among

[3] Includes brewpubs - Brewers Association (2015)

the other fifty states and Washington D.C. Total production in Oklahoma amounted to 25,425 barrels of craft beer. This ranks as 43rd in the country. On a per capita (drinking-aged adult) basis, though, Oklahoma again ranks 47th nationally.

Despite the relatively small industry size, the OKCB had an economic impact of $415.7 million dollars in 2014. This impact ranks Oklahoma 33rd nationally.

The $415.7 million economic impact of the OKCB industry is attributable to a number of factors that can be considered as "direct effects" or "indirect effects." The direct effect of the craft brewing industry comes from the amount paid to employees within the craft brewing industry. Total income for Oklahoma Craft Brewers in 2014 amounted to $128.3 million, which accounts for 30.8% of the total economic impact. This means that the average pay per employee in 2014 was $49,870. This compensation ranks 6th nationally – only behind New York, Washington D.C., Alaska, Minnesota, and New Jersey. The average income of OKCB employees is thus higher than employees in California, Pennsylvania, and Texas, which have well-cultivated craft brewing industries. This compensation also compares well with the state-wide GDP per capita of $41,871 or the nation-wide GDP per capita of $49,469.

The remaining 69.2% of the $415.7 million dollar economic impact is attributable to "indirect effects" like tax revenue and employment in other sectors along the supply chain. Supply chain employment includes agricultural jobs (grains, hops, etc.), wholesale distributor jobs, glass bottle production, restaurant, bar, and liquor store employment. For example, "indirect effects" can be seen by the existence and sale of craft beer at venues like Bleu Garten in Oklahoma City or The Patriarch in Edmond. At these locations, and others like them, food trucks from across the state are able to generate income for themselves and their suppliers which include local farmers and artisans, advertisers, and gasoline distributors among others. This gain in income has a reverberating effect throughout the economy as each individual spends their income at other locations pursuing other types of consumption. This is commonly referred to as the multiplier effect. In total, the OKCB contributed more than $288 million dollars in extra economic activity in 2014.

5.2 Comparative Economic Impact

One way to gauge the relative success of the Oklahoma craft brewing (OKCB) industry is to compare the economic impact of the industry with the impact in states of a similar population size. Using a sub-sample helps to reduce bias that is due to the sheer market size that a particular state's craft brewing industry is able to sell to, and helps to contextualize the output and impact of the OKCB industry. For this purpose, I choose states in a window of approximately one million people to Oklahoma's population, 3.8 million. Table 1, below, shows the sub-sample of states and their populations along with the economic impact of the craft brewing industry in each state. Within the 13 sub-sample states Oklahoma ranks 9th in terms of economic impact despite being the 6th largest state by population.

Table 1. Sub-sample states. Ordered by descending population

State	*Population*	*EI Rank*	*Economic Impact*
Alabama	4,849,377	8	$ 437,633,000.00
South Carolina	4,832,482	7	$ 443,241,000.00
Louisiana	4,649,676	2	$ 645,510,000.00
Kentucky	4,413,457	5	$ 495,103,000.00
Oregon	3,970,239	1	$ 1,837,356,000.00
Oklahoma	**3,878,051**	**9**	**$ 415,776,000.00**
Connecticut	3,596,677	4	$ 568,787,000.00
Iowa	3,107,126	3	$ 636,096,000.00
Mississippi	2,994,079	13	$ 222,614,000.00
Arkansas	2,966,369	13	$ 323,795,000.00
Utah	2,942,902	12	$ 389,908,000.00
Kansas	2,904,021	11	$ 415,776,000.00
Nevada	2,839,098	6	$ 480,128,000.00

Within the sub-sample, Oklahoma ranks 9th for total economic impact above only Kansas, Utah, Arkansas, and Mississippi. Within this sample Oregon immediately jumps out as having an enormous economic impact relative to the other states. Excluding Oregon, the average impact of the craft brewing industry in each state is $456.2 million. This puts Oregon's impact at nearly four times the amount of any other state. Notice, that Oklahoma is very similar in population to Oregon. The enormous economic impact seen in Oregon is due to the size of the Oregon industry which employs nearly six times as many people and produces nearly 15 times as many barrels of craft beer. In Oregon, any craft beer that is below 14% ABV may be sold in grocery stores, gas stations and markets, and brewers of all sizes have self-distribution rights. Clearly, the laws governing Oregon craft beer consumption and production are much less restrictive than in Oklahoma. We can see that Oklahoma's craft brewing potential impact given less restrictive laws is substantial.

The average production in 2014 for all sub-sample states was 141,199 BBls. The average craft beer production for the sub-sample excluding Oregon is 66,377. Table 2, below, shows the production total for each state in 2014.

Table 2. Total Production

State	*Barrels of Craft Beer*
Oregon	1,039,063.00
Louisiana	197,853.00
Utah	161,606.00
Connecticut	72,682.00
Kentucky	71,640.00
South Carolina	56,261.00
Nevada	52,684.00
Iowa	43,310.00
Alabama	39,452.00
Kansas	36,248.00
Oklahoma	**25,425.00**
Mississippi	24,725.00
Arkansas	14,641.00

Table 2 shows that Oklahoma produced a small amount of craft beer relative to the other sub-sample states. Even after excluding Oregon, the Oklahoma craft brewing industry clearly produces well below the amount other states produced (average of 63,777). If current state alcohol laws were changed to allow for refrigerated craft beer distribution in grocery stores, gas stations, and markets (as in other states) this production amount would surely increase considerably.

On a per-barrel basis, however, the Oklahoma craft brewing industry compares well to the rest of the sub-sample. Table 3, below, shows the amount of economic activity that is attributable to each barrel of craft beer.

Table 3. Economic Impact (EI) per barrel

State	*Impact per Barrel*	*Impact per Glass*
Arkansas	$ 22,115.63	$ 89.18
Oklahoma	**$ 16,353.04**	**$ 65.94**
Iowa	$ 14,687.05	$ 59.22
Kansas	$ 11,470.32	$ 46.25
Alabama	$ 11,092.80	$ 44.73
Nevada	$ 9,113.36	$ 36.75
Mississippi	$ 9,003.60	$ 36.30
South Carolina	$ 7,878.30	$ 31.70
Connecticut	$ 7,825.69	$ 31.56
Kentucky	$ 6,910.99	$ 27.87
Louisiana	$ 3,262.57	$ 13.16
Utah	$ 2,412.71	$ 9.73
Oregon	$ 1,768.28	$ 7.13

Each barrel of craft beer in Oklahoma generated $16,353 worth of economic activity. To put this in context, each 12 ounce pour of craft beer sold in Oklahoma generated an economic impact of $65.94. Within the sub-sample, Oklahoma is 2nd among the states with only Arkansas receiving more per barrel. This table also shows that while each additional barrel of craft beer generates more economic activity on the whole, the amount that each barrel contributes to economic activity gets smaller and smaller as production increases. Hence, there is a limit to the amount that the craft brewing industry could generate in additional economic impact. This feature is accounted for in the regression model presented below that explores how much the economic impact in Oklahoma will change by if the craft brewing industry was to mature and produce more craft beer.

5.3 Economic Impact with Industry Growth

Given the restrictive nature of existing laws and regulations that effect the Oklahoma craft brewing industry, it is useful to estimate what the economic impact of the industry would be if production increased. In other words, relaxing certain laws would have a stimulating effect on Oklahoma craft brewing production which would result in a larger economic impact. I present a range of estimates assuming the Oklahoma craft brewing industry increased production by 10%, 25%, or 50%. Note that multiple firms that I surveyed expressed more than 50% growth in 2015, and some expressed triple digit growth. According to IRi, the national average for growth in craft beer volume sales in 2015 was 18.8%.

For the growth regression analysis I use data on total craft beer production in barrels, the population of the state[4], the excise tax rate per gallon of strong beer, and the employment-to-population ratio[5] as determining factors.[6] [7]

Using the growth regression estimates, I am able to estimate how the craft brewing industry's economic impact will change if the industry produces more craft beer holding all other factors constant. Table 4, below, shows how much additional economic impact can be expected if the industry produced 10%, 25%, and 50% more craft beer.

Table 4. Economic Impact (EI) with Industry Growth

% Growth	Estimated % Increase in EI	Additional EI	95% Range	
10%	2.53%	$10.50 MM	$9.42	$11.58
25%	6.31%	$26.25 MM	$25.17	$27.33
50%	12.63%	$52.50 MM	$51.42	$53.58

If the Oklahoma craft brewing industry expanded by only 10%, economic activity would be between $9.42 and $11.58 million higher per year. This would amount to a total impact of over $425 million. Assuming a more aggressive growth path, the craft brewing industry could attribute between $51.42 and $53.58 million more in economic activity per year. This would amount to over $465 million dollars of economic activity.

Among the brewers that I surveyed, the median response for how much production increased was 51%. Using these estimates, I expect the 2015 economic impact to be approximately $469.4 million dollars. This represents a 12.9% increase over the 2014 impact. Note, that this estimate may underestimate the actual growth in economic impact because I only use responses from firms that produced in 2014. A number of new breweries began commercial production in 2015 and are thus not included in the construction of the 51% growth estimate.

[4] The impact of industry growth presented here remains statistically significant and is within a 95% confidence interval of the estimated coefficient when Barrels per capita is used as an independent variable instead of using Barrels and Population as separate regressors.
[5] I use the employment-to-population ratio instead of the unemployment rate as a measure of economic well-being because the unemployment rate is vulnerable to issues of working age adults leaving the labor force, among other reasons.
[6] I use the natural logarithm of each variable except the employment-to-population ratio so that I may interpret the estimated coefficients in terms of percentage change.
[7] Estimated via ordinary least squares with Heteroskedasticity-robust standard errors.

5.4 Direct Tax Revenues

Beyond the employment and income effects that the OKCB industry has had for their own employees and related industries along the supply chain, the OKCB industry contributes to the state economy as a source for tax revenues. The OKCB industry stands out, though, because of the nature of alcohol taxation. All beer production in the state of Oklahoma is taxed at the wholesale level as an excise tax, and at the retail level as an ad valorem tax.[8]

The current wholesale tax for beer in Oklahoma is $0.36 cents per gallon for beer that has an ABW of 3.2%, and $0.40 cents per gallon for "strong" beer that is above 3.2% ABW. Note, that craft beer has historically had an ABW in excess of 3.2% due to the type of beer that is demanded.

Where craft beer stands out as a significant tax revenue source is through the retail ad valorem tax. All beer sales in liquor stores are taxed at 8.35%, and beer sales sold in restaurants, bars, and brewpubs are taxed at 13.5%. Craft beer typically commands a higher price than competitors in the market due to the recent surge in popularity, and increasing taste preferences for stronger beers. This has a beneficial effect on tax revenues because items that have a higher price return a larger tax revenue per unit.

To estimate the amount of direct taxes that the OKCB industry raised, I use 2014 production information provided by the Brewer's Association, and sales type estimates (draft vs. bottle production, amount sold to restaurants vs. liquor stores, etc.) provided by a survey of Oklahoma craft brewing firms. For non-respondent companies I assume that their sales-type (draft vs. bottle) and destination (restaurant vs. liquor store) is equal to the median response of all brewers.

In 2014, the OKCB was responsible for approximately $5.6 million in tax revenues. These tax revenues were driven mostly by bar and restaurant sales which amounted to approximately $4.9 million. This is expected, though, given that craft beer commands a higher price in the market than its competitors. Moreover, given the existing restrictions on strong beer purchase, it makes sense that the majority of strong beer would be consumed in restaurants or bars. Wholesale taxes accounted for $322,275 in tax revenue and liquor store taxes accounted for $358,461.

5.5 Tax Revenues with Industry Growth

Table 5, below, shows the amount of taxes that would be generated if production grew by 10%, 25% or 50% while holding all other assumptions constant (e.g. amount of 3.2% beer production, percentage of total volume sold at establishments that allow on-site consumption as opposed to liquor stores, etc.). Note, that I use actual volume growth for firms when I have self-reported data, and the various growth assumptions for non-respondent firms (10%, 25% and 50%). From my survey, the minimum amount of growth in 2015 was reported as 11%, and the maximum amount of growth was 350%. The estimates presented in this section will likely underestimate tax revenue growth because I only use data for firms

[8] Defined in section 3.1 of this report.

that produced in 2014. A number of new breweries began commercial production in 2015 and are thus not included in this analysis.

Table 5. Tax Revenue with Production Growth

Tax Source	*10%*	*25%*	*50%*
Total Tax Revenue	$ 7,739,338.50	$ 8,211,061.33	$ 8,997,266.05
Liquor Store Taxes	$ 448,336.59	$ 479,515.61	$ 531,480.65
Restaurant and Bar Taxes	$ 6,859,156.27	$ 7,272,164.02	$ 7,960,510.28
Wholesale Taxes	$ 431,845.64	$ 459,381.70	$ 505,275.13

Note: Actual growth percentage used for firms that provided production data, various growth percentages used for all other firms

6. Conclusion

The national trend towards increased craft beer consumption has resulted in a veritable increase of economic activity that is directly attributable to craft brewers. At the national level, the craft brewing industry generated $55.7 billion dollars in economic activity and more than 424,000 jobs in 2014. While this growth in craft brewing has certainly taken root in Oklahoma, the full potential of this industry remains untapped.

In 2014, the OKCB industry had a $415.7 million dollar economic impact. Put another way, each pint of 12 ounce pour of beer produced in Oklahoma generated $65.94 worth of economic activity. In taxes alone, the Oklahoma craft brewing industry was responsible for approximately $5.6 million in direct tax revenues.

Given the existing laws that restrict craft beer production and consumption, there is a large amount of growth potential that could result in a substantial economic benefit to the state. If some or all of these laws were relaxed, an additional $10.5 million in economic activity could be realized assuming that the OKCB industry grew by only 10%. Assuming a more aggressive, yet feasible, growth path of 50%, economic activity will increase by approximately $52.5 million. In a state that prides itself in supporting entrepreneurship[9], it is natural for the burgeoning craft brewing industry to take hold. If restrictive state alcohol policies are amended, the OKCB industry can have a significant impact across the state.

[9] Entrepreneur Magazine recently named Oklahoma City as the best city to launch a business.

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8. Acknowledgements

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