Brewery Project

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Premise of the project

A group of beer-enthusiasts are hopping to bring a fresh brew near you. Using U.S. Census Data and Open Brewery DB, this team is looking to identify the demographics of the area with the most breweries and see what might be ideal conditions for where to open Stoutistics Brewery.

RESEARCH QUESTIONS

- What areas in the U.S. have the most micro and brewpubs?
- What city has the most micro and brewpubs, and what are the demographic characteristics of the areas within that city with the highest concentration of those breweries?
- What city has the least micro and brewpubs, and how do the demographic characteristics of that city compare with the demographic characteristics of the city with the most micro and brewpubs?

Data used

The analysis was performed with the use of following datasets and APIs:

- Brewery DB API
- Geopify API
- Census API - Parameters Sheet [mrkd]:
- ZIP/ZTCA crosswalk → DELETE IF NOT DONE
- .... → any other smaller data sets?

Analysis - Scope

Type of brewery: Micro & Brewpub

→ rationale: fastest growing also most data available; craft beer drinkers find “local” being important factor in purchasing decision

Area: Urban - comparative analysis maybe of 3 cities instead with per capita per 100k or something

Decision based on: demographics of the target craft beer drinker group characteristics compared to the resident census data

Dataframe/Ntbk Set up

Part 1 Dataframe setup

Brewery DF: Includes all our brewery data by city and zip code

a. Lat/long density/heat map of micro and brewpubs(RP)
b. Stacked bar chart of all "open"-type and planned breweries (no closed) per state (AH, NL)
c. Grouped bar chart of micro and brewpubs per state (AH, NL)
d. Stacked bar chart of top five states for number of micro and brewpubs (AH, NL)
e. Stacked bar chart of tail five states for number of micro and brewpubs (AH, NL)
f. Craft Capital: Heat map of city with most micro and brewpubs (RP)
g. Heat map of city with the lowest number of micro and brewpubs(RP)
h. Consider adding closed vs planning as percentage change for the state → create cumulative percentage to show market tendency eg 3% closing but 10% planned → 7% growth projected (if have time, AH)

Census DF: Includes population, income, employment status, occupancy status by city with population over 20,000 → building block DF

Merged DF: Includes all our breweries merged with the census DF

a. Table of top three cities that have the highest number of micro and/or brewpubs, along with demographic characteristics of those cities (focusing on median age, family vs. non family households, median income, and education) (NL did graphs for each variable and created a summary table per state in Summary document in my folder)
b. Table of the demographic characteristics of the cities where the micro/brewpubs exist compared to the city that has the least amount of them (but still has them!) (NLI need to change top10 and tail10 because it changed with last dataset, once it is final I can plot it)
c. Line chart comparison of the demographics of the city with the most micro/brewpubs vs. the demographics of the cities that have the least amount of micro/brewpubs (not sure what to chose, totpop, income?)

Zip Code Downloaded DF: Includes population, median income, household data by zip code

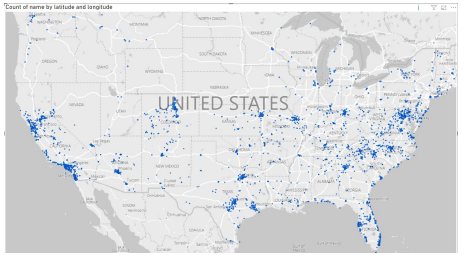
Part 2 City analysis

Calc the breweries per capita → *Merged DF*
Use the census data to find the common attributes of the cities with the most breweries per capita → *Merged DF*
Run an analysis to find which cities closely match the criteria with the cities with a lot of breweries → *Merged DF*

Part 3 Zip Code (if have time)

Identify the zip codes within the recommended city that are the best spots to open a brewery using the Zip Code downloaded dataframe

Craft Beer Capital

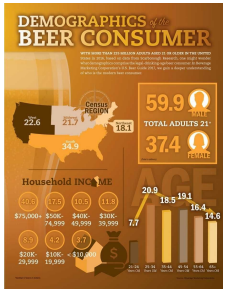


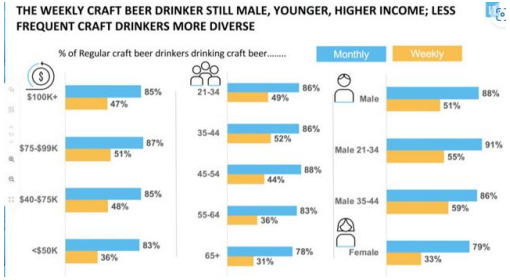
Q Answered: *What areas in the U.S. state, state, region have the most breweries with the highest density?*

Graphs:

- US/Country level:
  - Lat/long density/heat map of micro and brewpubs(RP)
  - Stacked or grouped bar chart of states with micro and brewpubs and/or Stacked bar chart of all "open"-type and planned breweries (no closed) per state - to visualize that micro and brewpubs are the most numerous (AH, NL)
  - Consider adding closed vs planning as percentage change for the state → create cumulative percentage to show market tendency eg 3% closing but 10% planned → 7% growth projected
- State level NL I graphed total brew numbers without filtering per brew_type and selected top10 and last10, we might need to do the same but filtering for micro, open, etc. Couldn't make the graph work when filtering.
  - Chart (possibly pie for variation) of cities within the state with the most micro and brewpubs (AH, NL)
- City level:
  - Craft Capital: Heat map of city with most micro and brewpubs (RP)
  - Heat map and/or graph of city with the lowest number of micro and brewpubs (AH - graph)

Our Demographic





Q Answered: *What are the demographic characteristics of areas with currently operating breweries, and what are the characteristics of areas where breweries closed?*

Our Demographic: single millennials - income 75K+ males + white nonhisp ➔ rationale non price discriminating and 40% of the craft beer consumer group willing to try new beer brands [based on articles]

What we need: → narrowed to BrewPub & Micro → Specific City

- Table of top three cities that have the highest number of micro and/or brewpubs, along with demographic characteristics of those cities (focusing on median age, family vs. non family households, median income, and education) (NLI did top10 and top last 10 states,)
- Table of the demographic characteristics of the cities where the micro/brewpubs exist compared to the city that has the least amount of them (but still has them!) (NL struggling, there are a lot of cities within each state and it is hard to plot, I did a pivot table though, maybe it is enough to show it like that)
- Line chart comparison of the demographics of the city with the most micro/brewpubs vs. the demographics of the cities that have the least amount of micro/brewpubs

Ideal Location Recommendations

Q Answered: *Based on density analysis, what are the characteristics of the ideal location for a new brewery?*

What we need:

- First narrow the scope to state or preferably to a city
- Run Census data for the state/city
- Weed out areas meeting our parameters relating to household data
- Per square mile brewery location density for a given area [county lvl?]→ compare totals for where closed vs were planning etc to optimize for competition
- Propose top 5 characteristics of a perfect location [ideas depending on what we might find]
    - State
    - Urban/rural/tourist
    - If urban, optimal city size
    - Income lvls
    - Household vs single household type breakdown
    - Competition density

Recommendation

Our new micro with brewpub locations:

Why ideal:

Analysis limitations

- No cost analysis relating to real estate, taxes, labor, & supplies
- Non-urban tourist locations largely excluded, but based on the analysis worth exploring based on visitor data for example ski resort towns
- No licensing or licensing limitation information
- No sales & profit margin information
- Limited data on closing & planned and no discrimination in type - when totals compared with the Brewers Association summaries
- Quality of beer and types of beer aka product offerings not discussed
- Lack of revenue projection data - requiring further analysis

Resources

https://www.foodandwine.com/beer/craft-beer/cities-most-craft-breweries

https://passionpassport.com/american-cities-craft-beer/#:~:text=San%20Diego%2C%20California&text=With%20long%20stretches%20of%20sandy,to%20this%20southern%20California%20oasis

Interesting summary with state of the union craft beer business data + per capita summary per state
https://vinepair.com/articles/map-states-most-craft-breweries/

Summary data by brewer association re sales and popularity of different types of breweries and overall sales - additional data on openings and closings

https://www.brewersassociation.org/statistics-and-data/national-beer-stats/

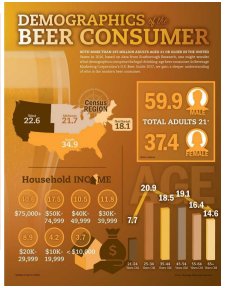
Business model discussion which can help us in narrowing the scope: https://www.brewersassociation.org/resource-hub/business-model/

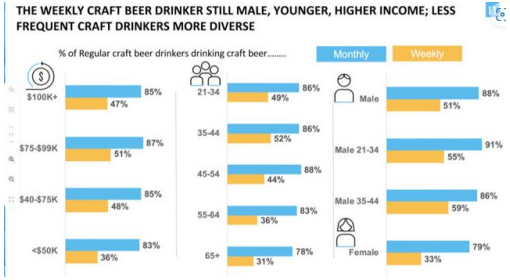
Craft beer drinker demographics summary: https://www.brewbound.com/news/power-hour-nielsen-shares-2019-craft-beer-consumer-insights/

Millenials and craft beers /consumer preferences
https://thebrewermagazine.com/new-research-reveals-current-beer-consumption-rates-influenced-mostly-by-history-of-personal-choice/

Final but cool on demos: https://blacktailnyc.com/who-drinks-craft-beer-demographics/

Spare/demo if Zips wor out





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What we need: → narrowed to BrewPub & Micro

- Summary comparison of demographic info for the ZTCs re household income & age distributions for the zips with current breweries with comparison against overall state benchmark → we are trying to show that the demos for the zips are different & matching our target → *we can think of actual stat analysis to show differences in populations*
  - Can be a bar graph or a table with a separate column for the delta
- Pull the closed ones to see if the areas met criteria same graphical representation as above
  - Comparison of demographic data of the survivors with those that closed if far apart of course.
- See if we have ZTCAs with large count of currently operating breweries and how demographics look for those top locations.
  - Scatterplot if possible of brewery count for the area vs income → can be for a state or group of zips [would have to figure out the grouping though to get large enough areas]
  - Proportion of singles vs family data for the area