

Capstone Project – The Battle of Neighborhood

Opening a new restaurant in Manhattan

Introduction

Background:

The restaurant industry is essential to New York City's social and economic fabric. From small, family-owned restaurants and food carts to four-star world-famous



establishments, the City abounds with restaurants that offer cuisines from every corner of the globe.

Restaurants lend vitality to each neighborhood and are integral to Manhattan's central business districts and the City's vibrant tourism industry, attracting millions of visitors each

year who spend a total of \$46 billion annually. The industry is the second largest component of tourism spending, behind lodging. Residents and tourists alike are drawn to live in and visit areas with thriving retail corridors anchored by restaurants. The industry contributed about 15 percent of total taxable sales citywide in 2019.

After a decade of job growth that was more than double the rate for local jobs overall, the restaurant industry reached its highest number of establishments and jobs ever in 2019. Despite relatively lower average wages, restaurants provide a steady source of jobs for many residents, particularly Hispanic and Asian minority populations and immigrants.

New York City's restaurant industry had 23,650 establishments in 2019, provided 317,800 jobs, paid \$10.7 billion in total wages citywide, and made nearly \$27 billion in taxable sales.

After a decade of job growth that was more than double the rate for local jobs overall, the restaurant industry reached its highest number of establishments and jobs ever in 2019. Despite relatively lower average wages, restaurants provide a steady source of jobs for many residents.

The New York City restaurant industry accounted for about 1 in 12 private sector jobs and establishments citywide in 2019 (8.1 percent of jobs and 8.7 percent of firms). Unless otherwise noted, all data on industry employment by place of work was made available through the New York State Department of Labor Quarterly Census of Employment and Wages (QCEW) According to the U.S. Bureau of Labor Statistics, nationally, the industry share is higher for jobs (9.5 percent) but lower for establishments (6.6 percent).

Most restaurants and bars are small and reflect great diversity. In New York City, 80 percent have fewer than 20 employees (less than 1 percent have 500 or more employees), yet they represent the cuisines of more than 150 different countries.

Citywide, 250,900 residents (both employed and self-employed) held occupations in the restaurant industry, with average annual earnings of \$30,500 in 2018 (the latest year for which this data is available). Additional employees commute from surrounding areas to work in the City's restaurants. All data on restaurants workers by place of residence use the U.S. Census American Community Survey, 2018 one-year estimates, unless otherwise noted.

More than half of the City's restaurant employment in 2019 (192,500 jobs) was located in Manhattan, with another 51,700 jobs in Brooklyn, 49,100 jobs in Queens, 15,900 jobs in the Bronx and 8,500 jobs in Staten Island. The industry had one of the lowest average salaries (\$33,700) among all private sector industries.

In Manhattan, most establishments and jobs are in Midtown and Lower Manhattan. The Chelsea/ Clinton/Midtown Business District, which includes the New York City Theater District, had the highest restaurant employment among all the City's 55 Census-defined neighborhoods (nearly one in four jobs citywide). Battery Park City/Greenwich Village/Soho had the second-highest restaurant employment.

Together, these two areas made up nearly 40 percent of the City's restaurant jobs. Restaurants as a share of establishments were highest in Chinatown/Lower East Side, at 20 percent. The restaurants and bars in these areas face special challenges due to the declines in tourism, office employees working on-site, and some residents relocating to second homes outside the City. According to the New York State Department of Taxation and Finance, the restaurant industry also contributed nearly \$26.9 billion in taxable sales from March 2019 through February 2020, about 15 percent of total taxable sales during that period, and grew 4.3 percent year over year.

Business problem

The goal of this project is to analyze and decide where to open a new restaurant in Manhattan.

Data

- Wikipedia scraping
Manhattan postal codes, area and location names, Manhattan-based datasets.
- Venues data
We will use the Foursquare API to collect venues based on the geographical coordinates of each postal code.
- Geographical coordinates
Manhattan geographical coordinates, which is a consolidated csv file.

Methodology

We will convert addresses into their equivalent latitude and longitude values. Afterwards will use the Foursquare API to explore neighborhoods in Manhattan, then the **explore** function to get the most common venue categories in each neighborhood, and then use this feature to group the neighborhoods into clusters. We will use the *k*-means clustering algorithm to complete this task. Finally, we will use the Folium library to visualize the neighborhoods in Manhattan and their emerging clusters.