

Starting a coffee shop in New York City (NYC)

Introduction

NYC is already a highly developed city, and there are tons of different venues across the city. It is also a place full of business opportunity, it is definitely worth a try to start a business there. Given the intensive competition in NYC, it is necessary to determine which district's market is not yet saturated. I would like to analyze the coffee shop market in NYC, to find out which district still has room for coffee shop, and is the most profitable as well.

The market of coffee in the US has only been growing and is expected to be growing as shown in figure 1 [1]. It is definitely a market worth investing.

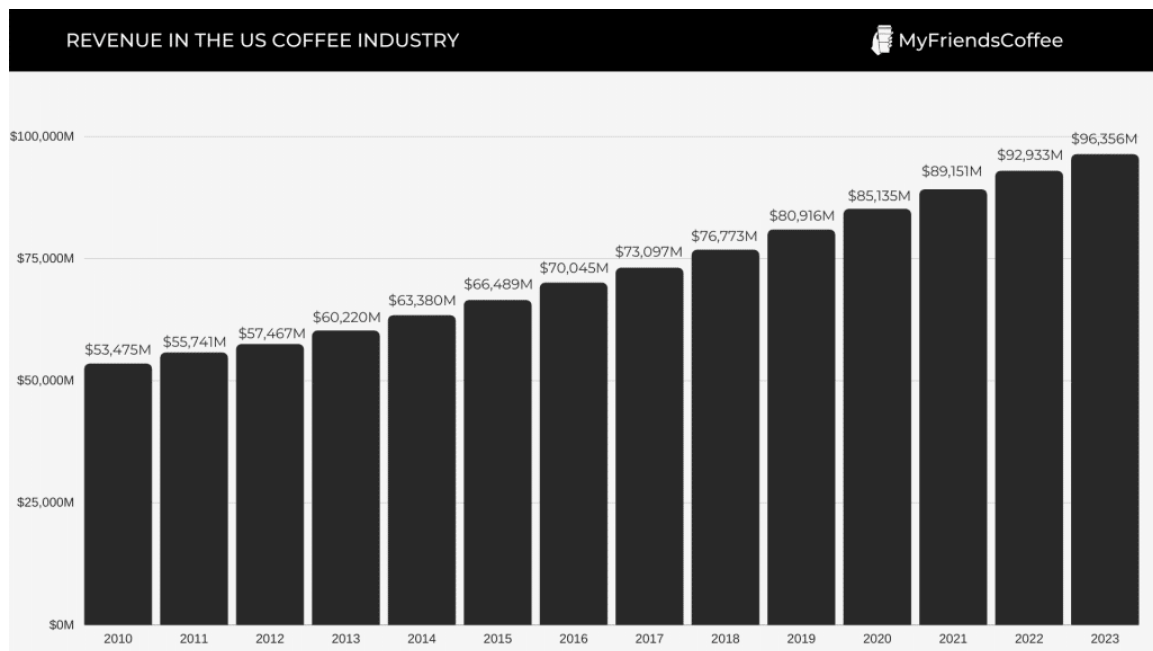


Figure 1: Revenue in the US coffee industry [2]

Regarding the drinking habit, 64% of American aged 18 and over (roughly 5 million people) drank coffee every day in 2019 (each day with an average of 2.7 cups) [2]. Additionally, according to National Coffee Association's 2018 report, 36% of the American had enjoyed coffee outside home and 15% of the respondent had enjoyed coffee both at home and outside [3]. The rough number of American drinking coffee outside is therefore at least 1.52 million.

According to statistics of coffee in the US, the most popular coffee shop in the USA is Starbucks (40%), Dunkin' Donut (26%), Caribou Coffee (21%) and others (21%) [4]. If we take this popularity index as market share in NYC, we can see the market potential of the coffee market in NYC by brand (figure 2). The result returned from the foursquare shows that there is no Caribou Coffee in NYC, so the share of Caribou Coffee is considered in others.

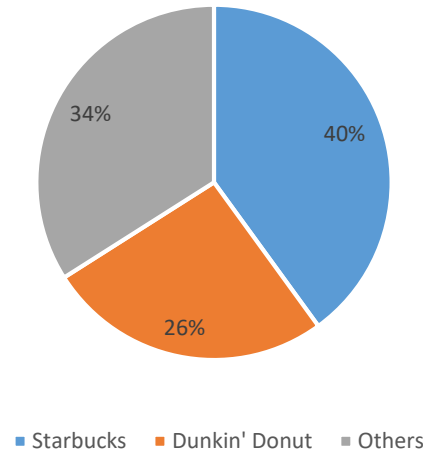


Figure 2: Coffee popularity as the market share of NYC

If we take the daily consume average of the US, which is 2.7 cups, and assume the price of the coffee as 1 dollar, we can get figure 3.

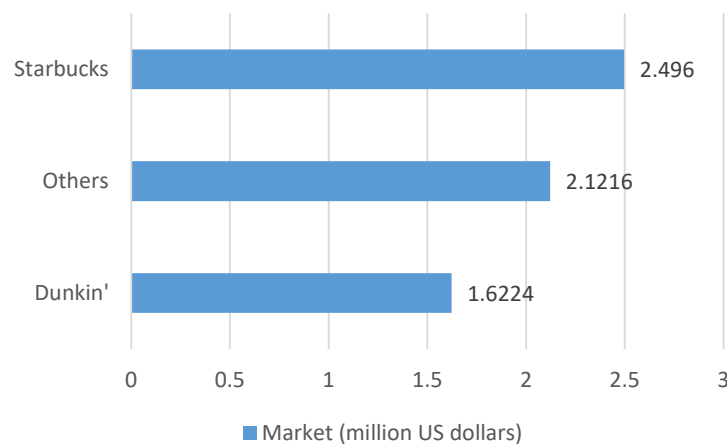


Figure 3: Coffee market of NYC per day

As it can be observed that, private brands still get over 2.1 million market a day! It is definitely worth researching and investing into this never stop growing market in NYC.

Objectives

To maximize the possibility of successfully starting a new coffee shop in NYC, a thorough analysis of the market of each area in NYC and the competition is necessary. The objectives of this project are to:

1. Find out the area where the coffee market is not yet saturated
2. Find out the most profitable area from the unsaturated areas in terms of cost and market potential

Data Used

1. NYC Neighborhood Data Profiles

The main data source is the data provided from the government at: <https://furmancenter.org/neighborhoods>. By selecting the district can the relevant data be shown, the indicators inside are, for example:

- Household median income
- Rent median income
- Poverty rate

This data source will be utilized in the part of area clustering, which will be introduced in the later chapter

2. Foursquare API

This API will be used to collect the information of the venues located in each area. This will later be a component in the saturation estimation part, which will be introduced in later chapter.

Methodology: Background

The methodology is built on an observation result from the distribution of the coffee shop, population, income. When searching for coffee on the Foursquare city guide, there are 2334 venues that provide coffee, and the distribution of them is show in figure 4. Manhattan has the most coffee shops among all the other boroughs, and the number of coffee shops is fairly equal in other places.



Figure 4: Coffee venue distribution in NYC

Next, when checking the population distribution using the data from [5], it can be observed that the majority lives in the Bronx and Manhattan. Unlike figure 4, the population is centered in several spots and the each of the boundary can be clearly drawn.

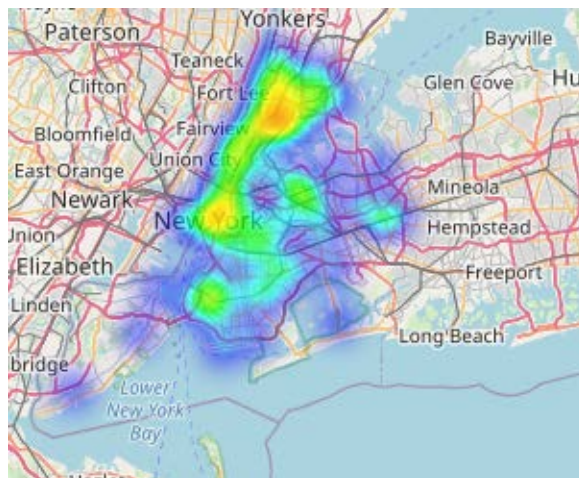


Figure 5: Population distribution in NYC

The difference between the distribution of coffee venue and population leads to the possible unsaturation in some of the district in NYC.

Methodology

The idea is to first find out the average number of coffee shop of each district group (consisted of similar districts described by demographic), and filter for the district whose number is still below the average (defined as unsaturated area).

Machine learning takes part in:

- Using the elbow law to find out the best number of cluster
- Using the following demographic data to cluster the neighborhoods
 - Car-free commute
 - Households with children under 18
 - Mean travel time to work
 - Median household income
 - Population
 - Population aged 25+ without high school diploma
 - Population density
 - Poverty rate
 - Serious crime rate
 - Unemployment rate
 - Units authorized by new residential building permits
 - Units issued new certificates of occupancy

Next the number of population and population density are considered as the market potential of the area. On the other hand, the median rent of the district is viewed as the cost of holding a coffee shop, since the majority of the cost will be rent (all the other expense will be quite similar across NYC).

Finally, the market potential (rank number 1 means the least profitable) and median rent (rank number 1 means the lowest) will be ranked. Then the difference between the ranks will be called profitability index. The higher the index, the more profitable it will be. This is because the index indicates how much the market potential can outweigh the rent.

The most profitable unsaturated areas can then be spotted, and the possibility of successfully run a new coffee shop can be higher.

Result

Based on the methodology described, there are 53 neighborhoods (there are 59 in total in NYC) whose coffee markets are unsaturated. Their profitability index are presented in figure 6 in a descending order (the neighborhood code is from [5], the comparison table is in the appendix):

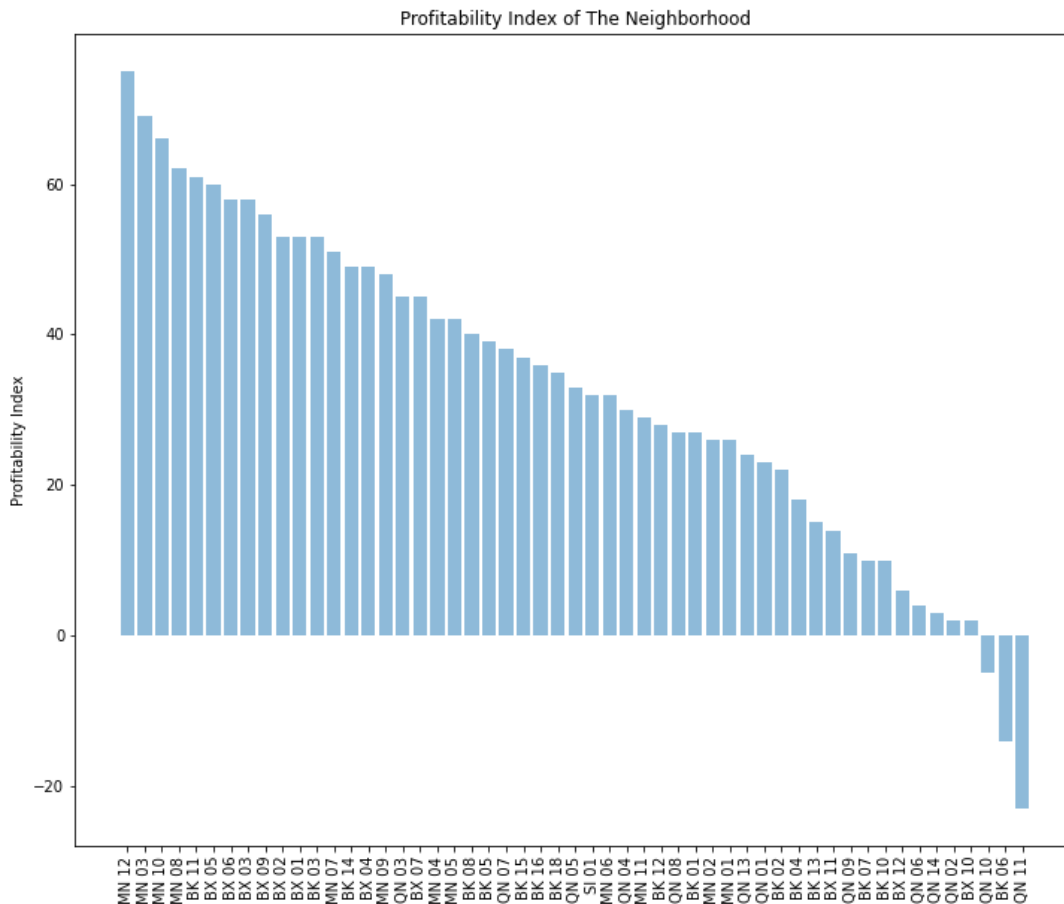


Figure 6: Profitability index of each unsaturated neighborhood

It can be observed that the neighborhood MN12 (Washington Heights/Inwood) is the most profitable area while the QN 11 (Bayside/Little Neck) is the least profitable area. The profitability index is visualized as heat map in figure 7.



Figure 7: Profitability of opening a coffee shop in unsaturated areas

Discussion

Although it might seem really competitive to start a coffee shop in NYC, where every business seems to be already matured, there is actually still room for new opportunities. The coffee market is growing at a fast speed which keeps making the demand bigger, which makes it worth a try. This analysis provides a preliminary analysis for the most profitable location to start a coffee shop, where the market is still unsaturated.

As the result shows in this analysis, there are still 50 neighborhoods, whose markets are still have space. By considering other additional factors (e.g. housing vacancy rate, target customers), a nice starting point of the coffee shop business can be ensured.

Reference

- [1] <https://www.statista.com/outlook/cmo/hot-drinks/coffee/united-states#revenue>
- [2] <https://www.census.gov/quickfacts/newyorkcitynewyork>
- [3] <https://myfriendscoffee.com/usa-coffee-statistics/>
- [4] <https://www.worldcoffeeportal.com/Research/LatestReports/Project-Cafe-USA-2020>
- [5] <https://furmancenter.org/neighborhoods>

Appendix

Table 1: Neighborhood code

BX 01	Mott Haven/Melrose
BX 02	Hunts Point/Longwood
BX 03	Morrisania/Crotona
BX 04	Highbridge/Concourse
BX 05	Fordham/University Heights
BX 06	Belmont/East Tremont
BX 07	Kingsbridge Heights/Bedford
BX 08	Riverdale/Fieldston
BX 09	Parkchester/Soundview
BX 10	Throgs Neck/Co-op City
BX 11	Morris Park/Bronxdale
BX 12	Williamsbridge/Baychester
BK 01	Greenpoint/Williamsburg
BK 02	Fort Greene/Brooklyn Heights
BK 03	Bedford Stuyvesant
BK 04	Bushwick
BK 05	East New York/Starrett City
BK 06	Park Slope/Carroll Gardens
BK 07	Sunset Park
BK 08	Crown Heights/Prospect Heights
BK 09	South Crown Heights/Lefferts Gardens
BK 10	Bay Ridge/Dyker Heights
BK 11	Bensonhurst
BK 12	Borough Park
BK 13	Coney Island
BK 14	Flatbush/Midwood
BK 15	Sheepshead Bay
BK 16	Brownsville
BK 17	East Flatbush
BK 18	Flatlands/Canarsie
MN 01	Financial District
MN 02	Greenwich Village/Soho
MN 03	Lower East Side/Chinatown
MN 04	Clinton/Chelsea

MN 05	Midtown
MN 06	Stuyvesant Town/Turtle Bay
MN 07	Upper West Side
MN 08	Upper East Side
MN 09	Morningside Heights/Hamilton
MN 10	Central Harlem
MN 11	East Harlem
MN 12	Washington Heights/Inwood
QN 01	Astoria
QN 02	Woodside/Sunnyside
QN 03	Jackson Heights
QN 04	Elmhurst/Corona
QN 05	Ridgewood/Maspeth
QN 06	Rego Park/Forest Hills
QN 07	Flushing/Whitestone
QN 08	Hillcrest/Fresh Meadows
QN 09	Kew Gardens/Woodhaven
QN 10	South Ozone Park/Howard Beach
QN 11	Bayside/Little Neck
QN 12	Jamaica/Hollis
QN 13	Queens Village
QN 14	Rockaway/Broad Channel
SI 01	St. George/Stapleton
SI 02	South Beach/Willowbrook
SI 03	Tottenville/Great Kills