

Maggie Ruan

Prof. MacDonald

ECON 2505ID

12 December 2023

Final Draft

Research Question: What is the relationship between unhealthy food access (ratio to bodegas to supermarkets) and neighborhood poverty rates?

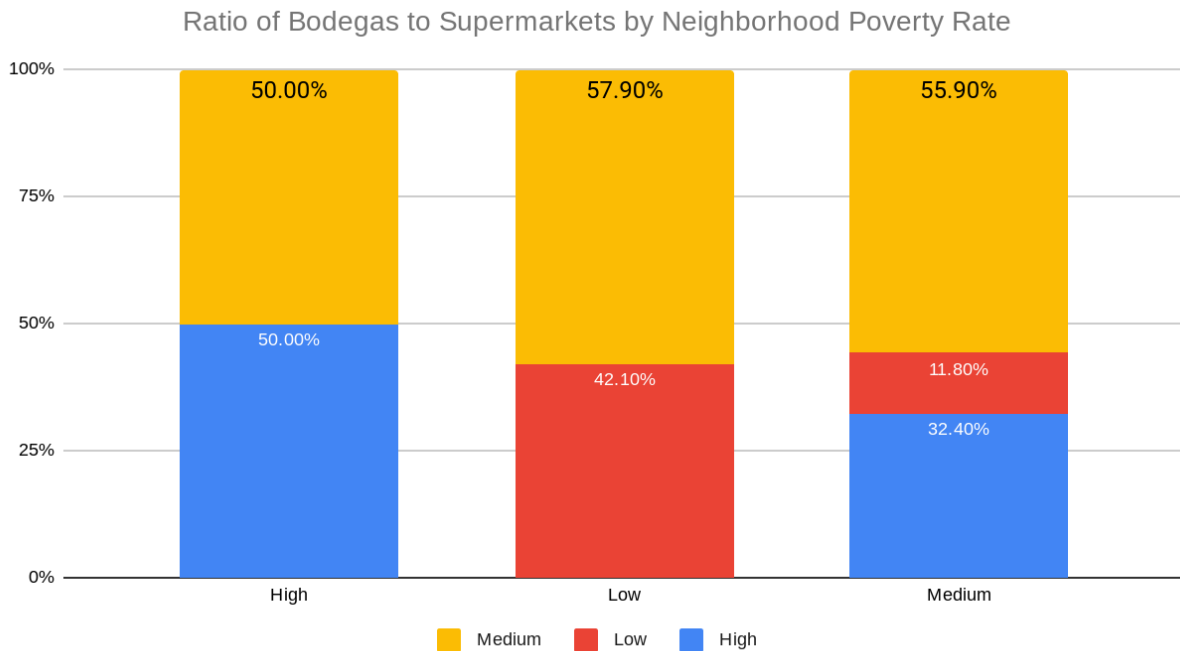
The topic of this research paper is determining the relationship between unhealthy food access which is determined by the ratio of bodegas to supermarkets, to the poverty rate in neighborhoods. Data regarding the ratio of bodegas to supermarkets was obtained through the Environment and Health Portal under the category of healthy eating, allowing the information of unhealthy food access to be obtained. The poverty rate in neighborhoods was obtained similarly under the category of economic conditions, and the table is provided regarding the poverty rate in percentage. While the year for ratio of bodegas to supermarkets was obtained in 2016, the poverty rate in neighborhoods was obtained from 2017-2021, and the data represents samples from community districts. The hypothesis of this research project would be if the neighborhood has a high poverty rate, then there will be a greater ratio of bodegas than there are supermarkets available in that community district.

<i>Poverty Rate</i>	<i>COUNTA of Rate of Bodega to Supermarket</i>			<i>Grand Total</i>
	<i>High</i>	<i>Low</i>	<i>Medium</i>	
<i>High</i>	50.00%		32.35%	23.73%
<i>Low</i>		42.11%	11.76%	20.34%
<i>Medium</i>	50.00%	57.89%	55.88%	55.93%
Grand Total	100.00%	100.00%	100.00%	100.00%

		COUNTA of Rate of Bodega to Supermarket			
Poverty Rate	High	Low	Medium	Grand Total	
High		3		11	14
Low			8	4	12
Medium		3	11	19	33
Grand Total		6	19	34	59

Source by [Pivot Table of Ratio of Bodega to Supermarket By Neighborhood Poverty Rates](#)

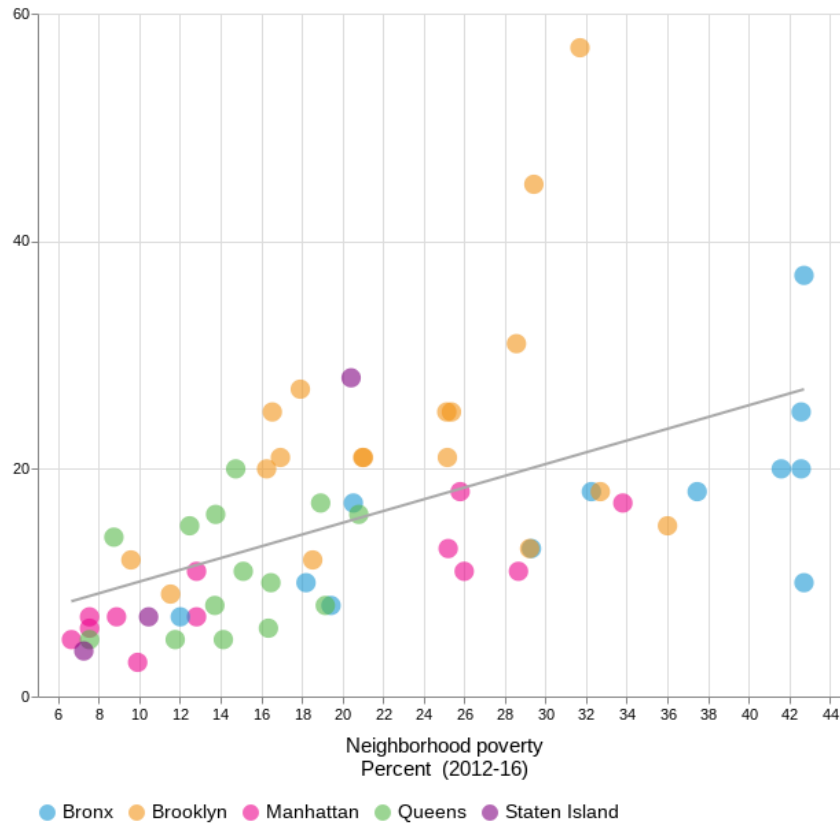
(Ruan, 2023)



The poverty rate of the data is determined by the communities that fall under the federal poverty line and is categorized into the following: Low= 0 to 10%; Medium= 10.1-25%, High= greater than 25%. Whereas the ratio of bodegas to supermarkets is formatted into the following: Low= less than 10; Medium= 10.1-25; High= greater than 25. Therefore, it can be interpreted

that in neighborhoods where the ratio of bodegas to supermarkets was high, 50% of the households had a high poverty rate. Simultaneously, neighborhoods that had a high ratio of bodegas to supermarkets, 50% of the households had a medium poverty rate, while no data is available on those with a low poverty rate in a high ratio of bodega to supermarket neighborhood. Similarly, there is no data available in high poverty rate neighborhoods with a low ratio of bodega to supermarkets. A low ratio of bodegas to supermarkets with a low poverty rate consisted of 42.11%, while 57.89% represented households with a medium poverty rate neighborhood had a medium ratio in bodegas to supermarkets. Finally, where the ratio of bodegas to supermarkets is a medium rate, 32.3% of neighborhoods had a high poverty rate. Whereas 11.76% had a low poverty rate, and had a low poverty rate neighborhoods, and medium poverty rate neighborhoods consisted of 55.88%. Based on the data, it can be determined that there is some association with the poverty rate and ratio of bodegas to supermarkets; the higher the poverty rate, the more likely the neighborhood has a high ratio of bodegas to supermarkets.

Unhealthy food access
Ratio Bodegas to supermarkets (2016)



The two variables regarding the scatterplot are the poverty rate in neighborhoods that fall below the federal poverty line; the dependent variable and the ratio of bodega to supermarket; the independent variable. As shown by the scatterplot, there is a positive correlation between the poverty rate and ratio of bodegas to supermarkets. Although it displays a weak positive correlation, the connection can be established where the greater the poverty rate, the greater the ratio of bodega to supermarket. The disparities in the neighborhood that contribute to the poverty rate mainly revolves around the lack of infrastructure such as the lack of public transportation or the distance accessing public transportation, the distance in obtaining fresh and healthy foods, traffic, and the income as the greater in possibility for that individual or household in obtaining fresh, healthy foods. Therefore, higher income neighborhoods are less inclined to have a higher ratio in bodegas to supermarkets and a lower poverty rate.

According to Bader, et al (2010), the components that affect the relationship between food deserts and access to healthy foods includes the possibility of race and income that would correlate with the density of food outlets, accessibility to travel, and safety of being able to travel. Food deserts are defined as “...areas with little or no provision of fresh produce and other healthy foods [which] may contribute to disparities in obesity or hypertension. When access to healthy food is limited, households must expend more time and/or money to eat a nutritious diet...”(Bader) Therefore, residents of a community district would be required to put more effort in obtaining healthy and nutritious diets than those who aren’t living in food deserts. This would be difficult to obtain since low-income or high poverty rate neighborhoods would not be able to use extra time nor money, other expenses like utilities or rent would inhibit their ability to be able to access fresh produce as more time and money is used to ensure those bills are being paid. Furthermore, the connection to those traveling to obtain fresh produce can be established with the variables in attempting to obtain fresh produce which includes: high crime rates, hazardous traffic, and accessibility for public transportation. Thus, highlighting the importance of personal vehicles as having one gives households more opportunities in retail environments than nondrivers since they are able to access more food retailers. The possibility of race and income plays a role between poverty rate and ratio of bodegas as “Neighborhoods with higher income levels and higher proportions of white residents tend to have greater access to supermarkets or larger chain food stores, while poorer neighborhoods and those with higher proportions of black or Hispanic residents may have relatively high access to small grocery stores. A few studies consider the access to convenience stores, with most finding that low-income or predominately minority neighborhoods have more access to these stores.” (Bader) Access to healthy and nutritious foods is nearly impossible for those in lower-income or high poverty-rate

neighborhoods as there is limited access to it. Supermarkets that contain fresh and more nutritious produce are found predominantly in higher-income neighborhoods with a higher population density of white residents. Grocery stores become the substitutes for high poverty rate neighborhoods despite having more unhealthy foods, and simply fulfill the requirement of having access to food for residents of that neighborhood.

Ver Ploeg (2010) speaks about residents of the neighborhood who do not live near supermarkets or food retailers that would provide nutritious or affordable foods. The food retailers that are available in low-income communities are presented with high prices which makes them unaffordable, deterring residents from eating healthier and more nutritious meals, making fast food or carryout foods more appealing and affordable. The study of low-income consumers in 2009 of approximately 40,000 U.S households show “Consumers with annual incomes between \$8,000 and \$30,000 paid the least of all income groups for the same food items. “ (Ploeg) Compared to other annual incomes, those with an annual income of \$8,000 to \$30,000 show they are less inclined to purchase food items like fresh produce, and primarily purchase milk, ready-to-eat cereal and bread when purchasing from grocery, convenience, discount/supercenters, and other forms of food retailers. It is also worth noting that nearly “.90 percent of all food stamp benefits were redeemed at supermarkets or large grocery stores..food stamp participants, on average, lived 1.8 miles from the nearest supermarket, they traveled an average of 4.9 miles to get to the store they most often used to buy groceries.” (Ploeg) Therefore, this highlights the importance of incentives by the government for low-income people to access fresh, healthier, and more nutritious foods or produce. While distance is still an issue, it is apparent that having food stamps provides neighborhoods, especially those with high poverty rates, to pay for those foods that would otherwise be too expensive to purchase. Despite some

grocery stores accepting food stamps, having 90 percent of food stamp participants redeeming in supermarkets, highlights how vital the government incentive or financing is to ensure a healthier diet.

Kathryn M. Neckerman, et. al, (2014) highlights the nutritional value between bodegas and fast food restaurants. In summary, while bodegas provide some healthy options compared to fast food restaurants like take-out and other national food chains, healthy eating isn't prominent in high-poverty neighborhoods, leading to a higher risk for obesity. Utilizing the Nutrition Environment Measures Study in Restaurants (NEMS-R) with a sample of 109 bodegas and 107 fast food restaurants in NYC, it was found that “The difference in fast food NEMS-R scores by neighborhood poverty appears to reflect neighborhood differences in the mix of fast food restaurants rather than within-chain differences. High poverty neighborhoods had more hamburger and fried chicken restaurants while low-poverty neighborhoods had more sandwich and coffee shops.” (Neckerman) The higher the NEMS-R total score was, the more it indicated having a healthier food environment; lower rates of poverty had higher NEMS-R total scores than those with higher poverty rates. Essentially, the dominant presence of hamburger and fried chickens supported the higher rate of obesity, hypertension or overweight; having a higher BMI, compared to those with access to more healthy foods. Thus, those with lower-income or residents with a high poverty rate have more access to affordable meals that are unhealthy.

The connections that can be established from the referenced articles and the statistical information found via the pivot table of the Ratio of Supermarkets to Bodegas and Poverty Rate, are similar in a sense that those falling below or on the federal poverty line have greater access to bodegas than supermarkets, giving residents more access to affordable yet unhealthy foods. Healthy foods are neither accessible nor affordable if they are able to access it. In summary, the

best course of action to ensure residents of low-income neighborhoods are able to access healthy foods is to have it more affordable and accessible. As shown, food stamps are the main government incentive to afford healthy produce, highlighting the importance of other forms of incentives for low-income communities. Other methods include promoting more on Green Carts or Mobile food vendors since the city subsidizes the cost of start-ups and gives the opportunities for residents to access healthier produce, while promoting the economy that can help increase the GDP; more businesses being developed in the food industry which in turn can provide more jobs or GDP.

Bibliography

Bader, M. D. M., Purciel, M., Yousefzadeh, P., & Neckerman, K. M. (2010, October). *Disparities in Neighborhood Food Environments: Implications of Measurement Strategies*. National Library of Medicine. <https://www-jstor-org.citytech.ezproxy.cuny.edu/stable/40929682>

Ploeg, M. V. (2010, March). *Access to Affordable, Nutritious Food Is Limited in "Food Deserts."* USDA: Economic Research Service. <https://www.ers.usda.gov/amber-waves/2010/march/access-to-affordable-nutritious-food-is-limited-in-food-deserts/>

Neckerman, K. M., Lovasi, L., Yousefzadeh, P., Sheehan, D., Milinkovic, K., Baecker, A., ... Rundle, A. (2014). Comparing Nutrition Environments In Bodegas and Fast-food Restaurants. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4465191/>

N/A, N. (2017). *Healthy Eating Data for NYC: Unhealthy Food Access*. Environment & Health Data Portal. <https://a816-dohbsp.nyc.gov/IndicatorPublic/beta/data-explorer/healthy-eating/?id=2389#display=summary>

N/A, N. (2021). *Economic Conditions Data for NYC: Neighborhood Poverty*. Environment & Health Data Portal. <https://a816-dohbsp.nyc.gov/IndicatorPublic/beta/data-explorer/economic-conditions/?id=103#display=summary>

Ruan, Maggie (2023). *Pivot Table of Ratio of Bodega to Supermarkets and Poverty Rate*.

<https://docs.google.com/spreadsheets/d/1eif-xPXse1BRPIPBFROkjM15b55Y4YQThkfiqxDA60/edit#gid=1395635577>