

Spring 5-2-2019

The Effect of the FRESH Program on Crime Rate in NYC

Ashley M. Kraus
CUNY Hunter College

[How does access to this work benefit you? Let us know!](#)

Follow this and additional works at: https://academicworks.cuny.edu/hc_sas_etds

 Part of the [Economics Commons](#)

Recommended Citation

Kraus, Ashley M., "The Effect of the FRESH Program on Crime Rate in NYC" (2019). *CUNY Academic Works*.
https://academicworks.cuny.edu/hc_sas_etds/439

This Thesis is brought to you for free and open access by the Hunter College at CUNY Academic Works. It has been accepted for inclusion in School of Arts & Sciences Theses by an authorized administrator of CUNY Academic Works. For more information, please contact AcademicWorks@cuny.edu.

The Effect of the FRESH Program on Crime Rate in NYC

By

Ashley Kraus

Submitted in partial fulfillment
of the requirements for the degree of
Master of Arts Economics, Hunter College
The City University of New York

2019

Thesis Sponsor:

May 2, 2019

Date

Dr. Partha Deb

May 2, 2019

Date

Dr. Matthew Baker

Table of Contents:

ABSTRACT	3
INTRODUCTION	4
REVIEW OF THE RELATED LITERATURE	7
DATA	10
VARIABLES	11
DATA STATISTICS	12
METHODS	13
ESTIMATION RESULTS	14
DISCUSSION	15
CONCLUSION	16
TABLES	18
REFERENCES	25

ABSTRACT:

This research examines whether opening up grocery stores in underserved areas in New York City have an affect on the occurrence of crimes in those neighborhoods. Using data from the New York City Economic Development Corporation (NYCEDC) on the Food Retail Expansion to Support Health (FRESH) grocery stores and the New York City Police Department (NYPD) on crime statistics by precinct, regressions are run to determine how the different types of crime varies across precincts over time with the introduction of the FRESH program by employing a difference in difference regression with fixed effects. The primary data for my project was collected from Historical New York City Crime Data by the New York City Police Department(NYPD). The key findings are that some incidence of crime, mainly misdemeanors, have declined while the seven major felony offenses have increased in the vicinity of the FRESH stores. This finding may reflect either an increase in felony crimes or be the result of the authorities laying more serious charges in an effort to suppress crime in theses areas.

INTRODUCTION:

This research examines whether opening up grocery stores in underserved neighborhoods in New York City have an affect on the occurrence of crimes in those neighborhoods. Using data from the New York City Economic Development Corporation (NYCEDC) on the Food Retail Expansion to Support Health (FRESH) grocery stores and the New York City Police Department (NYPD) on crime statistics by precinct, regressions are run to determine how the different types of crime varies from precinct over time with the introduction of the FRESH program. The regression models employ a difference in difference, fixed effects design.

In 2009 the City of New York established the Food Retail Expansion to Support Health (FRESH) program as a way to improve access to healthy food in neighborhoods that lacked access to full service supermarkets. The program was established in response to a study by the New York City Departments of Health and City Planning and the New York City Economic Development Corporation that found that many New York City neighborhoods were underserved by grocery stores (2008). In conjunction with this inter-agency study, the New York City Council established the New York City Food Policy Task Force to study food access issues, evaluate existing nutrition programs, and make policy recommendations. Out of these efforts emerged the FRESH program.

FRESH eased zoning requirements for supermarket development and offered financial benefits to encourage supermarket operators to open and expand stores in designated FRESH zones. Among the financial incentives available from the New York City Economic Development Corporation under FRESH are real estate tax abatements; waivers of sales taxes on materials used in construction of stores, and reductions in the mortgage recording tax. These incentives reduce the “up front” costs of opening or expanding a supermarket. The Department

of City Planning administers zoning incentives that developers can obtain are additional development rights for buildings containing supermarkets; elimination of requirements for parking, and the ability to construct larger stores in areas zoned for light manufacturing. These incentives are intended to address what Pothukuchi (2005) called the “urban disadvantage” of the “costs associated with urban store development and operation, and regulatory contexts that can facilitate or hinder speedy development.” Not all areas of the city were eligible for the program. Initially FRESH zones were located in Northern Manhattan, the South Bronx, Central Brooklyn, and Queens. The north and east shores of Staten Island would later be added to the program (https://www.nycedc.com/system/files/files/program/ida_fresh_eligibility_update_2018_square.pdf).

The city’s response was part of a larger national trend where cities and states addressed the problem of “food deserts.” “Food deserts,” which the United States Department of Agriculture defines as (American Nutrition Association), as “parts of the country void of fresh fruit, vegetables, and other healthful whole foods, usually found in impoverished areas. This is largely due to a lack of grocery stores, farmers’ markets, and healthy food providers.” Bell and Burlin (1993), in their study of supermarkets in Oakland, California, found that low-income areas often lacked a single chain-store supermarket while middle-income neighborhoods “wallow in them.” Food deserts are often neighborhoods with high crime rates (Illinois Advisory Committee to the United States Commission on Civil Rights 2011). High crime rates, among other factors, result in supermarkets being closed in urban areas (Zhang and Ghosh 2015). There has been considerable research of the relationship between the construction of new supermarkets and food access, with the projects being divided on the issue. Some studies have concluded that the construction of new supermarkets has positive impact on food access and health (Richardson

et al 2017), while others suggest there has been minimal impact (Kolak et al 2018). Florida (2018) asserts, “Opening new supermarkets has little impact on eating habits of people in low-income neighborhoods. Even when residents do buy groceries from the new supermarkets, they buy products of the same low nutritional value.”

Despite the absence of a consensus on whether new supermarkets have an impact on the consumption of healthy foods, cities like New York, continue to support the location of new supermarkets in underserved areas.

I will be using the police precincts and the introduction of the grocery stores under the FRESH Program as the basis for my analysis. There are currently 77 police precincts in New York City. Each police precinct in New York City serves to protect populations ranging from fewer than 70,000 to more than 150,000 residents. Also, there are currently 15 completed and operating FRESH grocery stores.

In my findings, I plan to determine if the newly opened and renovated supermarkets through the FRESH Program have an affect on the incidence of crime in the area. I suspect that additional supermarkets in an area will impact criminal activities. I hypothesize supermarkets impact criminal activities as either an attractor for crime or a contribution to a healthy community that deters crime. For example, shoplifting is likely to increase in the area since the supermarket presents an opportunity for this kind of crime. Robberies might also increase since an offender might see an opportunity in preying upon customers entering or leaving the store. Other types of criminal activity, such as minor violations/crimes such as loitering or crimes such as assault might decline because the amount of foot traffic to/from the store might act as a deterrent to potential offenders who wish to avoid being seen perpetrating their crime.

“Gathering places” have been found to reduce homicide rates (Papachristos et al 2011).

Therefore, a supermarket, while attracting “property crime,” may discourage violent crime.

This topic is important because it will inform policy makers as to the efficacy of these programs, which have become commonplace in urban areas throughout the United States as part of the effort to reduce the number of food deserts. The Fresh Food Retailer Initiative in New York City is intended to “promote the establishment and expansion of grocery stores in underserved communities by lowering the costs of owning, developing, and renovating retail space.” (<https://www.nycedc.com/program/food-retail-expansion-support-health-fresh>). This program was formed to provide incentives to increase the number of grocery stores in a neighborhood and help to retain the grocery stores that are currently operating in the area. Those who are in the government such as policymakers can use such findings for assistance in developing future policies.

REVIEW OF THE RELATED LITERATURE:

In 2009 the City of New York established the Food Retail Expansion to Support Health (FRESH) program as a way to improve access to healthy food in neighborhoods that lack access to full service supermarkets. FRESH eased zoning requirements for supermarket development and offered financial benefits to encourage supermarket operators to open and expand stores in designated FRESH zones.

FRESH is representative of programs established by a number of cities and states to encourage the construction of supermarkets in neighborhoods considered “food deserts.” In addition to the program in New York City, Philadelphia (the program eventually expanded to all of Pennsylvania), the District of Columbia, Illinois, Louisiana, Maryland, Michigan, Nevada, and Oklahoma have created programs that offer tax incentives, loans, or grants to incentivize the

construction of supermarkets in underserved areas. In 2010, the Obama Administration introduced the Healthy Food Financing Initiative where the federal government provides support to local community development corporations (CDCs) seeking to establish supermarkets providing nutritious food in food desert communities.

There is considerable body of research on the relationship between the construction of new supermarkets and improved nutrition, with the studies being divided on the issue. Some studies have concluded that the construction of new supermarkets has positive impact on food access and health, as was the case of a study of a Pittsburgh neighborhood (Richardson et al 2017), while others suggest there has been minimal impact (Kolak et al 2018), arguing that lower incomes and nutrition awareness, rather than supermarket location is more of a determinant in the food choices of consumers (Allcott et al 2018). The authors concluded that “The fundamental difference in America’s food and nutrition has more to do with class than location.” Cummins et al (2014), in their study of a Philadelphia “food desert” where a government assisted supermarket opened, found that while the store’s existence improved area residents’ perceptions of food access, it did not lead to changes in reported fruit and vegetable intake or body mass index. A 15-year longitudinal study found that greater supermarket availability was generally unrelated to diet quality and fruit and vegetable intake, and relationships between grocery store availability and diet outcomes were mixed (Boone-Heinonen et al 2011). Cohen (2018) summarizes later studies, noting

More recently, study after study has shown that the relationship between access and diet is more complex. Adding supermarket capacity to an under-served neighborhood does not, in itself, appreciably alter shopping, buying and eating behaviors, and thus has little measurable effect on diets, nutrition, and health. Residents may appreciate having new or

renovated supermarkets in their neighborhoods, but there is little evidence of significantly changed shopping behavior or nutritional health.

However, the relationship between crime and the location of supermarkets has been given far less attention. The existence of crime has been cited as a reason for supermarkets moving from low-income areas (Illinois 2011, Zhang and Ghosh 2015, Crowe et al 2018). Programs such as New York's FRESH Program were intended to incentivize the location of supermarkets in these areas. Supermarkets have been cited as important to the stability of a community (Payne et al 2017).

Rabinowitz (2014) examines the relationship between crime and supermarket location in Connecticut, finding that supermarkets attract more minor crimes (e.g., shoplifting) to communities and while it may serve as a deterrent to new stores being built, it is not necessarily the factor that causes stores to exit the community.

An early study by Fisher (1991) used surveys of businesses to determine whether crime was a factor in determining the location of their business. She found that crime and fear of crime was a major factor in their decision making. A study of neighborhood food environments in New York City (Bader et al 2010) found that "adjusting for vehicle ownership and crime tended to increase measured disparities in access to supermarkets by neighborhood." Wolfe et al (2014) conclude that the location of Wal-Mart stores leads to crime increases in the immediate areas. In a study of 278 Dutch neighborhoods, Steenbeek, et al (2011) found a positive relationship between business presence and neighborhood disorder, concluding that, "We expect the presence of businesses to affect disorder especially strongly in more disadvantaged neighborhoods" (2011).

DATA:

For the analysis, panel data was obtained from the New York City Police Department's records on reported crime and offense data during the years 2000 through 2018. This dataset is called the Historical New York City Crime Data. Measurements are reported by law class, which include felony, misdemeanor, and violation. These categories are broken down into broad crime and offense categories. The NYPD categorizes crime based on the definitions found in §10 of the New York State Penal Law.

Felonies are offenses for which a sentence to a term of imprisonment in excess of one year may be imposed. They are considered to be the most serious crimes. Offenses defined as felonies under the Penal Law include Homicide (§125.00); Grand Larceny (§155.42), and Assault (§120.00).

Misdemeanors are offenses for which a sentence to a term of imprisonment in excess of fifteen days may be imposed, but for which a sentence to a term of imprisonment in excess of one year cannot be imposed. Misdemeanors include Possession of a burglar's tools (§140.35); Petit Larceny (§155.25), and Issuing a Bad Check (§190.05).

Violations are offenses for which a sentence to a term of imprisonment in excess of fifteen days cannot be imposed. While Felonies and Misdemeanors are considered criminal offenses under the New York State Penal Law, Violations are not. Examples of violations include Trespass (§140.05); Disorderly Conduct (§240.20); Loitering (§240.35), and Exposure of a Person (§245.01).

The main categories of the crime variable include types of felonies, misdemeanors and violations. The crime datasets contain incidents that occurred within the 5 boroughs. This dataset

does not include federal criminal offenses. My sample size for my research reflects the 77 police precincts in New York City. This happens to reflect the population in New York City.

The FRESH Supermarket data I obtained by collecting the information on the supermarkets off the NYCEDC Website (<https://www.nycedc.com/program/food-retail-expansion-support-health-fresh>). After obtaining data on the grocery stores, I determined which police precinct the grocery store is located in through the “Find Your Precinct and Sector” interactive application on the NYPD website (<https://www1.nyc.gov/site/nypd/bureaus/patrol/find-your-precinct.page>).

For the grocery store dataset, I manually collected the information from the NYCEDC website, and used the NYPD Precinct Locator tool to determine which in police precinct each grocery store was located. The grocery store dataset includes all completed grocery stores up to January 2019. I then combined the Citywide Seven Major Felony Offenses 2000-2018, Citywide Non-Seven Major Felony Offenses 2000-2018, Citywide Misdemeanor Offenses 2000-2018, and Citywide Violation Offenses 2000-2018 data files to construct my primary crime data set. Then, I merged this dataset with my grocery store dataset.

VARIABLES:

The variable of interest in this study is the Crime variable, as this variable measures the amount of crime that occurs in a police precinct. The dependent variable, Crime, in this study will be analyzed separately by the different types of crime and NYPD precincts. The explanatory variable included in this study is Grocery. “Grocery” is a dummy variable that is equal to one if the police precinct had a Fresh Grocery Store after the policy went into effect and zero otherwise. The Grocery variable is the component of the model to show the effect of the policy on the treatment group overtime.

Grocery is a dummy variable that reflects in which years there is a FRESH Grocery store opened in a particular NYPD precinct. Also, the variable Grocery accounts for the years in the dataset that the Police Precinct has a Fresh Grocery Store. The years of focus for this study are 2000 through 2018.

DATA STATISTICS:

Table 1 includes descriptive statistics on the different types of crimes that occur in the average police precinct in New York City by 100,000 people each year, the average number of crimes per police precinct in New York City and the total number of crimes committed in New York City. Some examples of the most frequent crimes include: Petit Larceny, Harassment, Misdemeanor Dangerous Drugs, Assault and Related Offenses, Grand Larceny and Misdemeanor Criminal Mischief and Related Offenses. Some examples of the least frequently committed crimes include: Murder and Non-Negligent Manslaughter, Administrative Code, Felony Possession of Stolen Property, Offenses Against the Person, Felony Sex Crimes and Unauthorized Use of a Vehicle.

The results shown in this table are not surprising. As expected more violations and misdemeanors tend to occur as opposed to felony offenses such as rape and murder. For instance, the average number of murder and manslaughter is 6 per 100,000 people in New York City. This number makes sense since the amount of murders committed has drastically decreased since the 1970s. In addition, for every 100,000 people in New York City there are 19-reported rape related crimes committed. However, nowadays there is a huge issue with illegal control substance abuse. I'm not surprised that the amount of crime committed in New York City is a much higher amount compared to murder. The average number of misdemeanor dangerous drugs related crimes is 784 offenses per 100,000 people.

Table 2 demonstrates the increase in the number of completed and operating FRESH Program Grocery stores in New York City over the years of this study. The FRESH Program Policy was enacted by the New York City Council in 2009. As you can see the process in order to renovate and/or open a FRESH Grocery store can take some time. The first FRESH Grocery Stores didn't open until 2011. In 2011, two "Food Bazaar" grocery stores and a "Western Beef Supermarket" were opened for business. By the end of 2018 there were 15 completed FRESH Grocery Stores. However, according to the New York City Economic Development Corporation, there are another 27 FRESH stores "in progress" as of March 2019 (<https://www.nycedc.com/program/food-retail-expansion-support-health-fresh/fresh-map>)

METHODS:

The FRESH Program is not available to all parts of the five boroughs. The goal of this program was to offer zoning incentives and financial benefits in underserved communities. In addition once qualified to participate in the program there are some requirements for the Grocery store to be part of the FRESH program. The effect of the FRESH Program policy on crime can be studied as a Difference In Difference (DID) Fixed Effects Model. The variable Grocery in my model is the variable that accounts for the districts that got a Fresh Grocery store and in which year the Fresh Grocery store was open. This model accounts for any possible omitted time-invariant and time-specific variable because it sweeps out any trends from the treatment, control and covariates.

The Police precincts that have a FRESH grocery store can be considered the treatment group, while the districts that don't have a fresh grocery store are part of the control group. The FRESH program was passed by the City Council in 2011. There are two time periods for this model. The years prior to the policy from 2000 to 2011, which is when both groups are

considered untreated. After 2011 stores began to open at different times. I accounted for different precincts opening up grocery stores in different years through the independent variable. This variable is a dummy variable that is equal to one not only if it's a precinct that has a fresh grocery store but must also account for which year in that precinct the Fresh Grocery store is open. This is when the treatment group is exposed to the policy by FRESH Grocery stores being completed opening for business in New York City.

The equation below describes my regression, where Y is the "Crime" and the dependent variable in which is based on type of a crime. I ran numerous regressions based on the four categories of crime and the sub-division of each type of crime. The variable "Grocery" is an independent variable in my regression. The general description of the model is as follows: how crime varies from precinct to precinct over time due to the FRESH Policy Program.

My estimated equation is:

$$Y_{it} = \beta_1 + \beta_2 \text{Grocery}_{it} + \text{time fixed effects} + \text{PCT fixed effects} + e_{it}$$

ESTIMATION RESULTS:

The results are shown in five tables with a total of 37 regressions. Table 3 includes four regressions that include a dependent variable for one of the four categories of crime. The coefficient on Grocery for Total Violation Offenses is positive but is not statistically significant. This regression demonstrates that the FRESH Program doesn't impact the number of violation offenses people committed in New York City. However, the coefficient on the independent variable, Grocery, is negative and statistically significant at $p < 0.01$ for the total misdemeanor offenses regression. This shows that after the FRESH Program came into existence, the number of misdemeanor offenses decreases by 559 in a year. In terms of the city population, through the addition of the Fresh Program lead a decrease of 527 misdemeanor offenses in a year per

100,000 people. The coefficient for the regression with the dependent variable total non-seven major offenses is negative and is statistically significant at $p < 0.10$. The fourth main type of crime regression includes the dependent variable total seven major felony offenses. This regression is positive and statistically significant at $p < 0.01$. This regression demonstrates that after the FRESH Program came into existence, the number of major felony offenses increases by 127 in a year. Accounting for the total New York City population, after the Fresh Program came into existence led to an increase of 120 major felony offenses per 100,000 people in a year.

Tables 4 through 7 include regressions in which the dependent variables represent subdivisions of the main four crime types. The regressions that showed the independent variable Grocery with a positive statistically significant coefficient include the following regressions for: Misdemeanor Sex Crimes, Unauthorized Use of Vehicle, Fraud, Other Misdemeanors, Felony Dangerous Weapons, Felony Criminal Mischief and Related Offenses, Felony Assault and Grand Larceny. The regressions that showed the independent variable Grocery with a negative statistically significant coefficient include the following regressions for: Violations, Misdemeanor Possession of Stolen Property, Misdemeanor Dangerous Drugs, Misdemeanor Dangerous Weapons, Criminal Trespass, Aggravated Harassment, Felony Possession of Stolen Property, Arson, Felony Dangerous Drugs and Murder and Manslaughter.

DISCUSSION:

At the time of study only 15 FRESH Grocery stores have been completed. However, there are more stores in the process of being completed or renovated. Therefore, it is possible my coefficient on the dependent variables will have a larger effect on the sample size of completed stores, if this study is ran again once those additional stores are completed. This study is important to see if further funding should be given to the Fresh Program in New York City and

also perhaps policy makers in other cities and/or states may want to expand or implement a similar program.

CONCLUSION:

It appears that in precincts where FRESH supermarkets are located there appears to be a slight increase in felony offenses and more significant decrease in misdemeanors. Therefore, it appears that the overall incidence of crime have declined in these areas. The increase in felonies and decrease in misdemeanors maybe a result of the police charging offenders with more serious offenses in an effort to provide a safer environment in the vicinity of the FRESH grocery stores. An example of the change in charging can be shown through the regressions for misdemeanor dangerous weapons and felony dangerous weapons. The coefficient for Grocery in the misdemeanor dangerous weapons regression is negative and statistically significant at $p < 0.05$. This shows that after the FRESH program stores opened the number of misdemeanor dangerous weapons crimes decrease by 16 in a year. While the regression for Felony Dangerous Weapons demonstrates an impact on the grocery coefficient that is positive and statistically significant at $p < 0.01$. This shows that after the FRESH program stores opened the number of felony dangerous weapons crimes increase by 25 in a year. It appears that while some criminal offenses decline others, have increased suggesting that supermarkets both attract some types of criminal activity while deterring others. It may also suggest that the authorities, concerned about how crime might affect the viability of the FRESH stores, may be laying more serious charges against offenders in order to suppress crime.

TABLES:

Table 1: The Average # of Crimes per 100,000 People that Occur In New York City

Crime	Average # of Crime Per Precinct	Total # of Crime In NYC	Average # of Crime Per 100,000 People in NYC
ADMINISTRATIVE CODE (6)	14	1,094	13
AGGRAVATED HARASSMENT 2	398	30,622	375
ARSON	20	1,556	19
ASSAULT 3 & RELATED OFFENSES	667	51,385	629
BURGLARY	283	21,826	267
CRIMINAL TRESPASS	182	14,028	172
FELONY CRIMINAL MISCHIEF & RELATED OFFENSES	118	9,087	111
FELONY ASSAULT	254	19,574	239
FELONY DANGEROUS DRUGS (1)	309	23,821	291
FELONY DANGEROUS WEAPONS (2)	58	4,436	54
FELONY POSSESSION OF STOLEN PROPERTY	15	1,183	14
FELONY SEX CRIMES (3)	17	1,273	16
FORGERY/THEFT_FRAUD/IDENTITY THEFT	130	10,037	123
FRAUDS (3)	73	5,647	69
GRAND LARCENY	581	44,738	547
GRAND LARCENY OF MOTOR VEHICLE	189	14,588	178
HARASSMENT 2	941	72,484	887
INTOXICATED & IMPAIRED DRIVING	86	6,640	81
MISD. CRIMINAL MISCHIEF & RELATED OFFENSES	568	43,743	535
MISDEMEANOR DANGEROUS DRUGS (1)	832	64,097	784
MISDEMEANOR DANGEROUS WEAPONS (5)	78	6,022	74
MISDEMEANOR POSSESSION OF STOLEN PROPERTY	23	1,745	21
MISDEMEANOR SEX CRIMES (4)	59	4,557	56
MURDER & NON-NEGL. MANSLAUGHTER	6	484	6
OFFENSES AGAINST PUBLIC	126	9,681	118

ADMINISTRATION (2)			
OFFENSES AGAINST THE PERSON (7)	16	1,212	15
OTHER FELONIES (4)	166	12,811	157
OTHER MISDEMEANORS (8)	412	31,761	389
OTHER VIOLATIONS (1)	47	3,603	44
PETIT LARCENY	1,110	85,472	1,046
RAPE	21	1,623	20
ROBBERY	278	21,395	262
UNAUTHORIZED USE OF A VEHICLE	20	1,552	19
VEHICLE AND TRAFFIC LAWS	93	7,139	87

Table 2: The Number of Fresh Grocery Stores Opened in New York City

Year	# of Fresh Grocery Stores
2000	0
2001	0
2002	0
2003	0
2004	0
2005	0
2006	0
2007	0
2008	0
2009	0
2010	0
2011	3
2012	3
2013	5
2014	7
2015	8
2016	10
2017	12
2018	15

Table 3: The Estimated Effects of the Fresh Program on the Four Types of Crime

	Total Violation Offenses	Total Misdemeanor Offenses	Total Non Seven Major Felony Offenses	Total Seven Major Felony Offenses
Grocery	13.846 (28.142)	-559.254** (102.376)	-63.314 (34.215)	127.136** (42.981)
R2	0.61	0.43	0.21	0.61
N	1,463	1,463	1,463	1,463

Table 4: The Estimated Effects of the Fresh Program on Violation Offenses

	Harassment	Violations
Grocery	28.819 (27.350)	-14.974** (5.133)
R2	0.62	0.19
N	1,463	1,463

Table 5: The Estimated Effects of the Fresh Program on Misdemeanor Offenses

	Misdemeanor Possession of Stolen Property	Misdemeanor Sex Crimes	Misdemeanor Dangerous Drugs	Misdemeanor Dangerous Weapons
Grocery	-6.022** (1.995)	13.639** (2.186)	-429.247** (58.387)	-16.737* (6.506)
R2	0.29	0.19	0.37	0.27
N	1,463	1,463	1,463	1,463

	Petit Larceny	Assault and Related Offenses	Intoxicated and Impaired Driving	Vehicle and Traffic Laws
Grocery	3.019 (26.946)	-17.043 (15.416)	-6.399 (5.659)	-15.683 (10.276)
R2	0.19	0.33	0.23	0.18
N	1,463	1,463	1,463	1,463

	Misdemeanor Criminal Mischief & Related Offenses	Criminal Trespass	Unauthorized Use of Vehicle	Offenses Against the Person
Grocery	10.723 (19.591)	-132.256** (17.262)	6.910** (1.536)	0.398 (1.166)
R2	0.19	0.21	0.10	0.03
N	1,463	1,463	1,463	1,463

	Offenses Against Public Administration	Administrative Code	Fraud	Aggravated Harassment
Grocery	-0.095 (6.235)	1.405 (0.978)	14.885* (6.886)	-41.952** (10.894)
R2	0.18	0.17	0.20	0.69
N	1,463	1,463	1,463	1,463

	Other Misdemeanors
Grocery	55.209* (25.471)
R2	0.28
N	1,463

Table 6: The Estimated Effects of the Fresh Program on Non-Seven Major Felony Offenses

	Felony Possession of Stolen Property	Forgery/Theft-Fraud/Identity-Theft	Arson	Felony Sex Crimes
Grocery	-3.927** (1.438)	-7.536 (6.701)	-6.086** (1.367)	-1.759 (1.029)
R2	0.333	0.35	0.51	0.24
N	1,463	1,463	1,463	1,463

	Felony Dangerous Drugs	Felony Dangerous Weapons	Felony Criminal Mischief & Related Offenses	Other Felonies
Grocery	-111.337** (27.415)	25.200** (4.074)	30.362** (7.349)	11.771 (8.238)
R2	0.25	0.25	0.39	0.06
N	1,463	1,463	1,463	1,463

Table 7: The Estimated Effects of the Fresh Program on Seven Major Felony Offenses

	Murder & Manslaughter	Rape	Robbery	Felony Assault
Grocery	-1.668** (0.490)	-1.442 (1.074)	-7.644 (8.427)	59.818** (7.168)
R2	0.24	0.27	0.63	0.35
N	1,463	1,463	1,463	1,463

	Burglary	Grand Larceny	Grand Larceny of Motor Vehicles
Grocery	18.047 (11.942)	82.914** (26.595)	-22.887 (12.994)
R2	0.64	0.07	0.69
N	1,463	1,463	1,463

REFERENCES

Allcott, Hunt, Rebecca Diamond, Jean-Pierre Dubé, Jessie Handbury, Ilya Rahkovsky, and Molly Schnell, “Food Deserts and the Causes of Nutritional Inequality,” NBER Working Paper No. 24094. Issued in December 2017, Revised in November 2018.

American Nutritional Association, “USDA Defines Food Deserts,” *Nutrition Digest* 38 (2). <http://americannutritionassociation.org/newsletter/usda-defines-food-deserts>, accessed January 26, 2019.

Bader, Michael D. M., Marnie Purciel, Paulette Yousefzadeh, and Kathryn M. Neckerman; Disparities in Neighborhood Food Environments: Implications of Measurement Strategies, *Economic Geography*, Volume 86, Issue 4, October 2010, Pages 409-430.

Bell, Judith, and Bonnie Maria Burlin, “In Urban Areas: Many More Still Pay More for Food,” *Journal of Public Policy and Marketing* 12 (2) 1993: 268-270.

Boone-Heinonen J, Gordon-Larsen P, Kiefe CI, Shikany JM, Lewis CE, Popkin BM. Fast Food Restaurants and Food Stores: Longitudinal Associations With Diet in Young to Middle-aged Adults: The CARDIA Study. *Arch Intern Med.* 2011;171(13):1162–1170. doi:10.1001/archinternmed.2011.283

Bowes, David R., A Two-Stage Model of the Simultaneous Relationship Between Retail Development and Crime, *Economic Development Quarterly*, Volume 21, Issue 1, February 2007, Pages 79-90.

Cohen, Nevin, *REFRESH: Modifying the Food Retail Expansion to Support Health Program to Improve Healthy Food Access*. CUNY Urban Food Policy Institute Policy Brief, July 16, 2018.

Cohen, Nevin, and Nicholas Freudenberg, *Creating Healthy Food Access in a Changing Food Retail Sector*. CUNY Urban Food Policy Institute, nd.

Crowe, Jessica, Constance Levy, and Yolanda Columbus, “Barriers to Food Security and Community Stress in an Urban Food Desert,” *Urban Science*. **2018**, 2, 46; doi:10.3390/urbansci2020046

Cummins, Steven, Ellen Flint, and Stephen A. Matthews, “New Neighborhood Grocery Store Increased Awareness Of Food Access But Did Not Alter Dietary Habits Or Obesity.” *Health Affairs* 33, NO. 2 (2014): 283–291

Fisher, Bonnie, “A Neighborhood Business Area is Hurting: Crime, fear of crime, and disorders take their toll,” *Crime and Delinquency* 37 (1991), 363-373.

Florida, Richard, “It’s Not the Food Deserts: It’s the Inequality,” *Citylab*, January 18, 2018. <https://www.citylab.com/equity/2018/01/its-not-the-food-deserts-its-the-inequality/550793/>, accessed 4 April 2019.

Illinois Advisory Committee to the United States Commission on Civil Rights, *Food Deserts in Chicago: A Report by the Illinois Advisory Committee to the United States Commission on Civil Rights*, October 2011.

Kolak, Marynia , Michelle Bradley , Daniel Block, Lindsay Pool, Gaurang Garg , Chrissy Kelly Toman , Kyle Boatright , Dawid Lipiszko, Julia Koschinsky, Kiarri Kershaw , Mercedes Carnethon, Tamara Isakova, and Myles Wolf, “Chicago supermarket data and food access analytics in census tract shapefiles for 2007–2014,” *Data in Brief* 21, December 2018: 2482-2488.

New York City Department of City Planning, New York City Department of Health, and New York City Economic Development Corporation, *Going to Market: New York City’s Neighborhood Grocery Store and Supermarket Shortage*, October 29, 2008.

New York City Economic Development Corporation, “Fresh Stores,” 2019. <https://www.nycedc.com/program/food-retail-expansion-support-health-fresh/fresh-map>, accessed April 9, 2019.

Papachristos, Andrew V., Chris M. Smith, Mary L. Scherer, and Melissa A. Fugiero, “More Coffee, Less Crime? The Relationship between Gentrification and Neighborhood Crime Rates in Chicago, 1991 to 2005,” *City and Community*, 10 (3) 2011: 215-240.

Payne, Emily, Alexina Carter, Charles Platkin, and Emma Cosgrove, “Losing a Grocery Store Changes a Neighborhood,” *Civil Eats*, February 21, 2017. <https://civileats.com/2017/02/21/losing-a-grocery-store-changes-a-neighborhood-food-deserts-food-access/>, accessed February 20, 2019.

Pothukuchi, Kameshwari, “Attracting Supermarkets to Inner-City Neighborhoods: Economic Development Outside the Box,” *Economic Development Quarterly* 19 (3), August 2005: 232-244.

Rabinowitz, Adam Neil, *Crime and Supermarket Locations: Implications for Food Access? Doctoral Dissertations* .555. <https://opencommons.uconn.edu/dissertations/555/>, accessed January 26, 2019.

Richardson, Andrea S., Madhumita Ghosh-Dastidar, Robin Beckman, Karen R. Florez, Amy DeSantis, Rebecca L. Collins, and Tamara Dubowitz, “Can the introduction of a full-service supermarket in a food desert improve residents' economic status and health?” *Annals of Epidemiology* 27 (12), December 2017: 7716.

Steenbeek, Wouter, Beate Volker, Henk Flap, and Frank van Oort, “Local Businesses as Attractors or Preventers of Neighborhood Disorder,” *Journal of Research in Crime and Delinquency* 2011, Pages 1-36, <http://jrcd.sagepub.com>.

Wolfe, Scott E, David C. Pyrooz; Rolling Back Prices and Raising Crime Rates? The Walmart Effect on Crime in the United States, *The British Journal of Criminology*, Volume 54, Issue 2, March 2014, Pages 199–221, <https://doi.org/10.1093/bjc/azt071>

Zhang, Mengyao, and Debarchana Ghosh, “Spatial Supermarket Redlining and Neighborhood Vulnerability: A Case Study of Hartford, Connecticut,” *Transactions in GIS* 20 (1): 79-100.