A HOUSEHOLD LEVEL ANALYSIS OF POVERTY AND FOOD SECURITY CHARACTERISTICS DURING THE 2007 RECESSION WITHIN NEW YORK CITY

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by
Amy Uber
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Special Committee Members: Dr. Per Pinstrup-Andersen
Dr. Calum Turvey

ABSTRACT

The objective of this work is two-fold. It will first produce poverty and food security characteristics from the New York City Food Bank 2007 and 2012 Hunger Safety Net surveys which are amenable to policy. Then manipulate current income thresholds to locate opportunities for an improved measure. The surveys used for this analysis were random samples of New York City residents who relied on the NYC Food Bank as a safety net during the recession and recovery spanning years 2007 to 2012. Ideas for this work were drawn from three studies, the first, located poverty determinants within rural and urban Kenyan villages [Geda et. al., 2005] the second, explored food insufficiency as tied to income within the United States [Gundersen et. al, 2001] the third, determined how characteristics of an impoverished population could improve current measures[Leblanc, 2001]. This work utilizes a solid framework of poverty and food insecurity through a thorough literature review and draws a t-test and an OLS Probability model to analyze common characteristics across food bank populations. The results of this work determined that New York City residents rely upon the New York City food bank even if they are not classified as "in poverty" or "food insecure" based on the food stamp eligibility criteria and poverty income thresholds for 2007 and 2012, thus, exploring the question, are current measures for food insecurity and poverty accounting for the entirety of the current need and could additional understanding of those characteristics that are common among this population help improve measures for an overall improved definition of food poverty? By determining common characteristics across the food bank population to test multiple thresholds on the target population I sought to determine whether changes within current income thresholds could account for a larger population in need. Results of the income threshold manipulation displayed a consistent and insignificant change across data contributing additional knowledge to current literature showing that even by manipulating the current income measures, those who rely upon current safety nets are still not accounted for within government measures. As a result, government programming could be improved by reexamining current income thresholds and be redefined including expenditures and additional characteristics that emerge within this work. Additional food poverty characteristics that emerged within this work included disabilities, household income, food stamp participation, race; household size, residence, and education level were significant and consistent across key recession years. While this analysis was not able to analyze the same food bank recipients within 2012 as in 2007, it is interesting to note that overall characteristics of those drawing upon this safety net changed as a potential result of the recession. Recession effects such as education level among this target population showed that while those food bank recipients in 2007 generally obtained less than a 12^{th} grade education, within 2012, those with a degree equivalent to a high school degree were more likely to be in poverty, race and even area of residence also changed across the recession years. As a result, this work contributes significant characteristics and income threshold tests which contribute to overall poverty literature and could inform policy towards improving current measures and defining a new food poverty definition.
Key Words: Food Security, Nutrition, Food Stamps, Government Programming, Food

BIOGRAPHICAL SKETCH

Amy Uber is the youngest of six children and a twin within a family of eight. She was raised in Burnsville, Minnesota by two incredible parents. While serving among Thai and Laotian immigrants for three years, Amy gained a personal understanding of poverty and food insecurity and has sought real solutions to poverty and food insecurity within the United States. Amy arrived at Cornell University with a unique corporate America background, significant research and studies abroad which contributed to her understanding throughout her graduate research.

While completing her first master's at Cornell University, Amy became aware of food insecurity in both a national and international setting. With a deep drive to aid marginalized communities, Amy sought a second master's to combine her experiences and course work to understand the nature of food insecurity on a national level. From this background emerged a desire to provide additional understanding of those who struggle to meet their basic needs. By directly applying her corporate training, multi-disciplinary education, and previous work with Feeding America, this work was implemented as a capstone to Amy's education and experiences. Drawing from this background Amy promotes food security and food safety issues as a Senior Agricultural Economist for the California Department of Food and Agriculture.

ACKNOWLEDGMENTS

The result of this work is due first, to my primary adviser, Per Pinstrup-Andersen for his incredible willingness to accept my ambitious ideas and excellent guidance towards a useful thesis, my secondary adviser Calum Turvey for his desire to help me understand food security within the United States, my mentor, Elaine Hill who helped me overcome seemingly insurmountable obstacles, the incredible love of my husband, Kent Uber, and the on-going support of my wonderful parents, John and Darlene Nichols.

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PREFACE

Recent Capitol Hill debates on the US Farm Bill could result in significant cuts to food stamps. As a result, increased participation in US Food Banks are anticipated for families to meet their basic consumption needs. In addition to these recent events, the economic recession spanning 2007 to 2009 with residual effects still felt within 2013 and throughout the world produced increases in food prices**,** unexpected unemployment, underemployment, increased rental costs, and greater challenges among struggling Americans to meet their basic consumption needs. Now, more than ever before, solutions are sought for improved systems and policies to help support those struggling to meet their basic consumption needs.

The USDA has committed to confront these food insecurity challenges in America by setting a goal of, "Cutting United States food insecurity in half by 2015 through the creation and expansion of partnerships that build local food systems and reduce hunger" (ADA, 2010). These current systems include regional food banks and pantries for immediate and emergency safety nets, community gardening, and free breakfast and school lunches for children.

Building local food systems to aid regional hunger is a strategic plan for reaching the most vulnerable populations in America, in addition to improving regional independence. To conduct this kind of programming more effectively and reach as many of those in need as possible, certain knowledge must be obtained regarding vulnerable populations. As a consequence, this work will address poverty and food insecurity specifically in New York City's five boroughs. This location was

chosen as a sample group specifically because it ranks 17th in the nation for poverty and houses the largest Food Bank in the United States and consequently reaches a large number of its vulnerable population providing greater information for solid statistics (Allison, 2010).

Resulting from the high demand on this safety net in New York City, the Food Bank has sought to quantify the common characteristics of their population in order to provide a "face to poverty in NYC" (Hunger Safety Net 2007). Consequently, a Hunger Safety Net survey has been conducted by the New York City Food Bank every few years. Drawing from their 2007 survey, just before the economic downturn, and their survey in 2012, following the recession, these samples provide an interesting random sample displaying the real face of poverty and food insecurity within New York City homes. These surveys drawn by the NYC Food Bank contribute a significant descriptive analysis of those relying upon the food bank in NYC, but could benefit from a deeper analysis explaining significance regarding both participants of the NYC Food Bank and characteristics of the larger population.

The objective of this work is to produce significant poverty and food insecurity characteristics from the New York City Food Bank 2007 and 2012 Hunger Safety Net Survey. This will provide greater understanding of the NYC population and those factors, which are amenable to policy, which were statistically significant during the economic recession. This work will set the foundation for an understanding of those factors that contribute to poverty and food insecurity within New York City, provide for regional understanding of those who rely upon safety nets to meet their basic needs, and give greater insight for more strategic and efficient programming and

measures. Due to the timeline of these surveys, the data will also provide a review of how the recession impacted the face of poverty within New York City. Additionally, this work will investigate current measures based on income thresholds for food insecurity and poverty and explore whether the current measures are accurately meeting the current needs. These objectives will be accomplished in four stages: First, explain the methodology of the 2007 and 2012 data obtained through the New York City Food Bank. Second, provide a framework of poverty and food insecurity displaying definitions, common measures, and notable findings of poverty and food security characteristics. Third, provide a theoretical explanation of the OLS Regression model used for this analysis. Fourth, conclude with an explanation of findings.

CHAPTER 1
METHODS

Data Source and Collection

Data was drawn from the 2007 and 2012 NYC Hunger Safety Net Surveys administered within New York City's five boroughs, namely Brooklyn, Manhattan, The Bronx, Staten Island and Queens. Please see Tables 3-6 for descriptive statistics which differed across the population drawn from the New York City Food Bank recipients. The NYC Hunger Safety Net report is drawn every few years for the purpose of providing information on New York City's Emergency Food Programs (EFP). These surveys are purposefully conducted for a socio-economic and socio-demographic description regarding the usage of programs such as soup kitchens and food pantries, and to obtain detailed information of the population accessing the programs. The 2007 and 2012 Hunger Safety Net Surveys aim at providing the literal face of food insecurity and poverty for policy makers and government officials for improved policies aiding these vulnerable populations.

The method of obtaining the data within the NYC Food Bank Hunger Safety Net was consistent. During the 2007 and 2012 studies' interviewers underwent training on specific survey dissemination techniques to minimize bias and the survey was created for a completely randomized sample of pantries and soup kitchens. The procedure for site selection and survey dissemination is as follows: first, sites were selected using an algorithm to randomly select programs and ensure that interviews were conducted at the correct proportion of small and large soup kitchens and food

pantries in each borough. Second, each site was notified that interviewers would arrive on certain days for logistical purposes (but the selection of which centers was completely random). Third, upon arrival to the program, interviewers notified the program director. Fourth, interviewers then approached recipients waiting in line and asked permission for their participation in the survey. Each participant of the survey was informed that the survey was impartial and confidential, for example, interviewers never asked for names and/or any personal identifying information (Food Bank, 2007). Finally, Food Bank recipients were interviewed face to face at randomly selected soup kitchens and pantries, otherwise known as EFP's (Emergency Food Programs).

A list of answers were provided for the interviewer and based on the response, the interviewer selected from the list that answer which most closely fit the response. The respondent never saw the list of potential answers to ensure accurate reporting. Each survey participant was allowed to refuse any question they did not feel comfortable answering and were allowed to stop the survey dissemination at any time during the survey. It is important to note that recipients were randomly approached, interviewed and were required to be at least 18+ years old to participate. Consequently, this sample explains characteristics among the adult population within NYC. The 2007 Hunger Safety Net survey consisted of 78 questions and the 2012 Hunger Safety Net consisted of 40 questions. Questions drawn for this analysis were consistent across both surveys in question and potential answers. The specific methodology of site selection allowed for a proportion of interviews to be conducted at random times during the month allowing for accurate findings related to food stamp usage (Food Bank, 2007).

Analytic Sample

The analytic sample for this work included participants who were 18 years of age or older with no regard to income, employment or race and drawing upon the food bank network at the time of survey collection. It is important to note that there were no restrictions to who could draw upon food bank programs. Consequently, this survey is a strong representative sample of the New York City population who rely upon Feeding America Safety Nets for at least minimal food security. This analytic sample was drawn from the total survey population of 1,170 in 2007 and 1,229 in 2012 and separated according to household size, and respective thresholds, namely the poverty threshold and food stamp threshold. Those with income above the poverty threshold were placed into a group considered "not in poverty" or "food secure" or otherwise written as "not eligible for food stamps" and those below the poverty threshold according to household size were placed in a group considered "in poverty" or "food insecure" or "eligible for food stamps". Due to the conflicting nature and natural bias of the current food security scale, this work employed the food stamp threshold allowing for similar methods of threshold analysis.

Food Security Status

The initial intent of this survey's questions was to provide a literal perspective of those suffering from food poverty in NYC. In order to more closely define food poverty quantitatively, this work analyzes both the poverty and food stamp eligibility threshold to understand common characteristics which could provide further understanding toward defining a food poverty measure, and to better determine whether the current measures accurately portray the need that is prevalent throughout

the United States. Consequently, for our purposes, all clients participating within Feeding America programs within NYC are considered "food insecure" and therefore ought to be food stamp eligible, because they are relying upon these resources for adequate consumption. It is assumed within this work that only individuals who are in need of additional food resources would invest the time and resources to attend a soup kitchen or pantry.

Dependent and Independent Variables

To assess the food insecurity and poverty characteristics across NYC's five boroughs, I draw upon poverty eligibility and food stamp eligibility thresholds as dependent variables to analyze the sociodemographic predictors which include gender, employment status, housing, age within groups, household income, food stamp participation, household size, health, education, ethnicity, borough, food program (food pantry and soup kitchen) and the Supplemental Nutrition Assistance Program (SNAP) or, as referred here for our purposes, as the food stamp or SNAP program, eligibility amounts.

Potential Error

Due to the nature of the survey, bias could have resulted in forms such as:

1. Reporting bias, those participating in the survey could be worried that accuracy in answers, such as income, to the survey could result in decreased resources in the future.

2. This work drew upon poverty and food stamp eligibility income thresholds for 2007 and 2012, although some of the data was collected in 2011.
3. This work uses reported income per month and multiplies this number by 12 for yearly income. This survey does not take into account the variability of employment within this population and consequently, challenges with reportedly low incomes resulted.
4. The interviews were conducted in multiple languages' sometimes encompassing Spanish, Russian, and Mandarin or Cantonese (potential bias could have resulted due to limited interviewers with language skills to communicate to all recipients of the food bank) (Food Bank, 2007).
5. Data does not take into account anyone under age 18 and therefore is only representative of the adult population within NYC.
6. Thresholds do not take into account age groups of household members. This factor alone drastically influences the level of food security and poverty within a home.
7. Removed all households of 10 or higher due to these results residing as mostly outliers.
8. To ensure that the age range 65 or older did not mistakenly account for missing responses, I coded my data to specifically not include missing responses for those older than 65. All other age ranges were not subject to the same error.

CHAPTER 2

LITERATURE REVIEW

To fully comprehend the variables contributing to poverty and food insecurity and eventually understand the characteristics contributing to each for an improved definition of food poverty, the most widely sourced definitions and measures will be utilized. Poverty is defined here to be "Pronounced deprivation in well-being" (World Bank, 2005). And is further explained by,

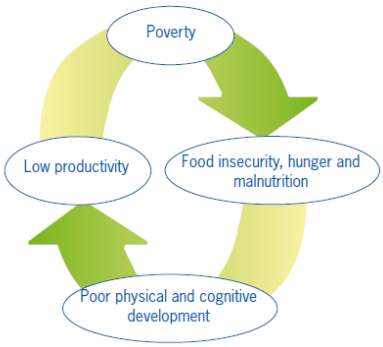
> The conventional view [of poverty] linking well-being primarily to command over commodities, so the poor are those who do not have enough income or consumption to put them above some adequate minimum threshold. This view sees poverty largely in monetary terms. Poverty may also be tied to a specific type of consumption; thus someone might be house poor or food poor or health poor. These dimensions of poverty can often be measured directly, for instance by measuring malnutrition or literacy. The broadest approach to well-being (and poverty) focuses on the "capability" of the individual to function in society. The poor lack key capabilities, and may have inadequate income or education, or be in poor health, or feel powerless, or lack political freedoms (2005).

Poverty is largely a decreased capability due to a deficiency in economic, social or physical factors which hinders an individual's ability to contribute and function within society.

A well-used definition of poverty as defined by the Organization for Economic Co-operation and Development(OECD) states that "Poverty encompasses different dimensions that relate to human capabilities including consumption and food security, health, education, rights, voice, security, dignity and decent work" (FAO,2008). Simply put, there are multiple dimensions that impact basic human capabilities which

can lead an individual to become empowered or impoverished. The result of the latter is contribution to a cycle of poverty (shown in Figure 1) that reproduces throughout generations.

Figure 1: Food insecurity, malnutrition and poverty are deeply interrelated phenomena



[Source: FAO, 2008]

Poverty is currently measured by a numerical value that determines the specific impoverished state below or above U.S. government determined minimal income threshold, varied by the number of members within a family, composition, and yearly income. The 2007 and 2012 poverty thresholds are shown in Chart 1 and Chart 2. This United States poverty measure was created in 1963 as the one measure that helps determine overall the amount of money required to feed a family (Cook, 2002).

Chart 1: 2007 & 2012 HHS Poverty Guidelines		
Household Size	2007 Household Yearly Income	2012 Household Yearly Income
1	$10,210	$11,170
2	$13,690	$15,130
3	$17,170	$19,090
4	$20,650	$23,050
5	$24,130	$27,010
6	$27,610	$30,970
7	$31,090	$34,930
8	$34,570	$38,890
9	$38,050	$42,850
10	$41,530	$46,810
	SOURCE: Federal Register, Vol. 72, No. 15, January 24, 2007, pp. 3147-3148	SOURCE: Federal Register, Vol. 77, No. 17, January 26, 2012, pp. 4034-4035

The United States Poverty threshold is beneficial in that it provides a general estimate of those who are mostly and completely impoverished, and aids a rough division between those who are able to meet their basic resources versus those who cannot. However, greater measures are needed to account for variability within the population

labeled as ‘in poverty’. Providing strong characteristics of poverty within a randomized population could produce a strong measure of the face of poverty in New York City.

It is important to note that the threshold measurement is controversial for a number of reasons. First, this poverty measure uses income before taxes, thus displaying vulnerable residents with more money than they actually have available.

Second, the Census Bureau uses the consumer price index which only represents the inflation on specific goods and services and does not account for the variation of goods and services pricing among states, nor individual preferences for food among consumers.

Third, it does not account for the distribution of resources within a family which may vary among cultures determining whether or not certain individuals within a household are more food insecure than others.

Fourth, defining specific poverty limits based only on income creates room for inaccurate reporting. For example, yearly income may be high but health costs expend more than half of a family’s income, leaving a family in poverty. Additionally, throughout the recession, unemployment increased. The poverty measure requires the previous year’s income, which does not accurately account for the current potential challenges influencing one’s economic status.

Finally, poverty thresholds do not account for regional differences and challenges such as high food and rent prices within inner cities, limited access to grocery stores, varied standards of living based on region and rural versus urban settings. The United States Census Bureau adds,

> If a family's total income is less than the family's threshold, then that family and every individual in it is considered in poverty. The official poverty thresholds do not vary geographically, but they are updated for inflation using Consumer Price Index (CPI-U). The official poverty definition uses money income before taxes and does not include capital gains or noncash benefits (such as public housing, Medicaid, and food stamps)(Census Bureau, 2011).

As a result, for better reporting, this work also does not account for public housing and Medicaid benefits.

From these measures and definitions emerges understanding and the belief that improving poverty will not improve economic development. Income is discretionary and therefore different based on personal preferences, spending habits and geographic region. Isabel Sawhill, from the Urban Institute, found that "Economic growth need not lead to a reduction in poverty, particularly if such growth is accompanied by a greater inequality of income" (Sawhill, 1988). Sawhill was insinuating that economic growth does not automatically lead to poverty reduction and multiple other factors need to be accounted for within the calculation. Consequently, the answer for poverty reduction must be reevaluated for alternatives.

Another study conducted by Michael LeBlanc of the United States Department of Agriculture explains that,

> Macroeconomic conditions suggest that low wages and not the unemployment rates are the most important characteristic of poverty in the long run…[and] further suggests that a key to permanently reducing poverty is to improve the returns to labor, which could be achieved by improving education and job training"(qtd in. Hisham, 2008).

Additionally, poverty conditions could be strongly influenced by a change in minimum wage raised to allow for those working full time, or two or more part time

jobs equating to full time, to receive adequate compensation based on the regional standard of living to meet their basic needs.

Further studies display the characteristics of poverty such as type of housing, "type of family considered", head of household gender, and stock of assets such as government tax, and transfer programs providing households with cash benefits as alternative measures which must be employed to meet the real need for government safety nets (qtd in. Hisham, 2008). Overall, there is room for improvement of adequate and accurate measuring of the face of poverty in US Policy circles.

From poverty derives food insecurity. Food Security is generally used to measure the deprivation level of the individual who is "in poverty" based on their access to food. Food insecurity results when an individual's financial obligations cause the individual to pay bills over adequate nutritional consumption. Derived by over 200+ definitions, food security will be defined by the two most well-known, namely, the Food and Agricultural Organization of the United Nations (FAO) and the United States Department of Agriculture (USDA). These definitions provide insight into what aspects contribute to food security. Food security, as defined by the Food and Agricultural Organization, states that "Food security [is] a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (FAO, 2002). Of all definitions presented by the FAO, this is the most comprehensive. It encompasses an anthropocentric nature of food security, thus can be used in both national and international food security measurements and finally, explains the social, physical, and economic access of safe and nutritious food

in meeting dietary needs. This definition defines the ideal situation of a food secure individual; that real access is social, physical and economic in nature and, in order for you to personally be food secure, the food consumed must aid your nutritional development.

The second most popular definition is The United States Department of Agriculture (USDA). The USDA as used by the New York City Food Bank, defines Food Security as, "Someone who has access at all times to enough food to lead an active, healthy life" (Food Bank, 2004). Drawing upon these two definitions of food security, how are households measured and classified as food insecure? Generally food insecurity can be depicted through anthropometric measures (tests of height, weight, upper arm circumference, and blood tests displaying hematocrit and hemoglobin levels). Wasting and stunting are the official signs of individuals consuming below their daily recommended calories. However, within the United States, some of the more common side effects of food insecurity include poor cognitive development, difficulty focusing in school, obesity, and behavior challenges in children that can influence future productivity and influence our country's economic future.

Between years 1930 and 1980, measuring food insecurity went through a series of changes beginning with hunger as an antithesis of food insecurity and molding to a series of questions now regarded as the Household Food Security Survey. The Food Security Survey Module (FSSM) created by the USDA and Health and Human Services, provides an instrument for obtaining standardized data on food insecurity. It contains food insufficiency questions (results displayed in Figure 2) to help classify a

household as “hungry”, “at risk of hunger”, or “not hungry” (Hampl, 2002). This module is presented with the US Census Bureau population survey distributed to national populations every few years and determines food insecurity within the previous 12 month time period, as well as specifies money shortages, and other opportunities to obtain adequate food. The survey has molded into 18 questions (10 questions for families without children, 8 for families with children) allowing for more specific analysis. These questions have been utilized to analyze food insecurity beyond a poverty threshold. They also determine what situations cause food insecurity, framing ideas for improved safety net efficiency. The FSSM survey allows for segregation of food secure and food insecure groups by gathering responses of yes/no answers during the census survey. In addition, it is very important to note that when using the FSSM survey [noted in Figure 2] measures are self-reported, subjective, and allow opportunity for bias. Once measures are drawn from the survey, questions are divided into two categories of households with children and households without children.

Figure 2: Questions in the U.S. Food Security Scale

1. "We worried whether our food would run out before we got money to buy more." Was that often, sometimes, or never true for you in the last 12 months? 2. "The food that we bought just didn't last and we didn't have money to get more." Was that often, sometimes, or never true for you in the last 12 months?	Household Food Secure
3. "We couldn't afford to eat balanced meals." Was that often, sometimes, or never true for you in the last 12 months? 4. In the last 12 months, did you or other adults in the household ever cut the size of your meals or skip meals because there wasn't enough money for food? (Yes/No) 5. (If yes to Question 4) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months? 6. In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food? (Yes/No) 7. In the last 12 months, were you ever hungry, but didn't eat, because you couldn't afford enough food? (Yes/No)	Household Food Insecure Without Hunger
8. In the last 12 months, did you lose weight because you didn't have enough money for food? (Yes/No) 9. In the last 12 months, did you or other adults in your household ever not eat for a whole day because there wasn't enough money for food? (Yes/No) 10. (If yes to Question 9) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?	Household Food Insecure With Hunger
(Questions 11–18 are asked only if the household included children aged 0–18 years) 11. "We relied on only a few kinds of low-cost food to feed our children because we were running out of money to buy food." Was that often, sometimes, or never true for you in the last 12 months?	Child Marginally Food Secure
12. "We couldn't feed our children a balanced meal, because we couldn't afford that." Was that often, sometimes, or never true for you in the last 12 months? 13. "The children were not eating enough because we just couldn't afford enough food." Was that often, sometimes, or never true for you in the last 12 months? 14. In the last 12 months, did you ever cut the size of any of the children's meals because there wasn't enough money for food? (Yes/No)	Child Food Insecure Without Hunger
15. In the last 12 months, were the children ever hungry but you just couldn't afford more food? (Yes/No) 16. In the last 12 months, did any of the children ever skip a meal because there wasn't enough money for food? (Yes/No) 17. (If yes to Question 16) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months? 18. In the last 12 months, did any of the children ever not eat for a whole day because there wasn't enough money for food? (Yes/No)	Child Food Insecure With Hunger

Source: Coleman-Jenson et. al, 2011

An example of how the questionnaire is scored, noted by Dr. Hampl,

> To score the questionnaire for the household with children, a "yes" response to an 0-2 items is considered food secure; a "yes" response to any 3-7 items is food insecure without hunger; 8-12 items, food insecure with moderate hunger; 13-18 items, food insecure with severe hunger…For households with no children, a "yes" response to any 0-2 items is considered food secure; 3-5 items food insecure without hunger; 6-8 items, food insecure with moderate hunger; 9-10 items, food insecure with severe hunger…Counted as "yes" if it occurred in 3 or more months during the previous year (Hampl, 2002).

The nature of this survey is controversial for a number of reasons. First, although simple, this measure creates opportunities for unreliable and inaccurate reporting. As explained above, within this kind of reporting, the recipient may be biased to answer in a certain way or omit pertinent information out of fear of benefits being influenced, or a hope to obtain more benefits.

Second, because the questions only requires a yes/no answer and does not allow for additional details influencing the recipients food security, this measure does not accurately account for regional difficulty, nor estimate accurately varying situations, and therefore, the validity of the survey could be compromised. Consequently, additional measures are needed for accurate reporting of those who are food insecure.

Finally, food security status is based on how many answers receive a reply of "yes". If the respondent answers "yes" to only 0-2, they are still considered food secure, although they may have difficulty obtaining food. Additionally, the degree of food insecurity increases the more answers in which they reply "yes".

In addition to the FSSM Survey, food insecurity can also be measured by eligibility for food stamps. This eligibility is determined by income, similar to the Poverty Guidelines [Shown in Chart 1 & 2]. As shown in Chart 3 and 4, the eligibility for food stamps is determined by a household's size and monthly income. Factors of regional variability such as differences in standards of living or distribution within households, age of household members (other than adult versus child), and variable employment are not accounted for; these factors, when measured and accounted for, would provide further insight regarding the recipient's level of food insecurity.

Chart 2: 2007 & 2012 Food Stamp Eligibility Criteria		
Household Size	2007 Household Monthly Income	2012 Household Monthly Income
1	$1,037	$1,211
2	$1,390	$1,640
3	$1,744	$2,069
4	$2,097	$2,498
5	$2,450	$3,356
6	$2,803	$3,785
7	$3,156	$4,214
8	$3,509	$4,643
9	$3,856	$5,072
10	$4,217	$5,501
	Source: 2007 NYC Food Hunger Net	Source: NYC.gov

When looking at food insecurity and the prevalence of food stamp usage, "Food-insecure households are more likely than other households to have low income and thus to be eligible for food stamps, furthermore, among eligible households, those that are food insecure are more likely to apply for food stamps" (pg. 10, Nord, et. al, 1999).

A study by Dr. Craig Gundersen et. al., further analyzed those variables influencing food insecurity Dr. Gundersen also located gaps in government programming in reaching the entirety of the food insufficiency need. Gundersen claims the real challenges that are generally noted include those behind consumption decisions with resources. Generally two similar houses with similar budgets and constraints could differ in food security based on individual decisions and preferences. In addition, unexpected shocks and changes to household income can adversely affect the distribution of that income and the eventual outcome of food security or insecurity. Gundersen claims that those households with larger incomes and resulting purchasing power are better able to weather unexpected shocks; however those with lower

incomes are placed in a perpetual cycle of poverty. Final conclusions resulted that households with average incomes, not only the lowest incomes, and minimal to no savings are more likely to be food poor...in addition, "Households facing liquidity constraints are more likely to be food insufficient"(Gundersen, 2001).

Gundersen's work then proceeds to compare food insufficient households with food sufficient households over a nine month period and found that "Food insufficient households have relatively low average incomes, face more income shocks, and are less able to weather these shocks with savings or through borrowing" in comparison to food sufficient homes(Gundersen, 2001).

Gundersen also found that variability of income as a result of shocks have a significant impact on the ability of a low income household to withstand shocks (2001). Second, those families with savings were more likely to maintain food security than those without. Third, home ownership in many circumstances provided cheaper monthly payments than rental payments on an apartment. Fourth, health insurance provided the unexpected safety net when health challenges resulted and allowed for income to be spent on food security rather than the unexpected health challenges (Gundersen, 2001). Expenditure analysis instead of income could provide improved measurement of the variability within households and therefore afford improved reporting and measurement.

Gundersen concluded that, "The coexistence of food-sufficient households with incomes below 50 percent of the poverty line and food insufficient households with incomes above 150 percent of the poverty line is evidence that mean incomes and food insufficiency are not perfectly correlated"(Gundersen, 2001). Gundersen drew

this analysis from a household study maximizing their utility subject to a budget constraint over multiple periods (2001). Assumptions were drawn that households viewed within the study, could borrow from family or friends during times of need regardless of real future income and each participant is unaware of when deviations from their mean income will occur (shocks) (2001). Gundersen did not see fit to equal incorporate interest earnings on assets (2001). Gundersen's claims insinuate that defining the need for regional analysis and regional characteristics to better measure for variability and factors influencing food insecurity is an important aspect of defining a more comprehensive model.

Finally, as mentioned above, the definition of poverty can be tied to a command over commodities (World Bank, 2005). When those commodities are lacking, they cause someone to become poor within those resources. For example, those who find it difficult to obtain enough food for adequate consumption as a result of financial pressures are considered "food poor". Food poverty is defined as "a condition of lacking the resources to acquire a nutritionally adequate diet" (Greer et. al., 1986). Consequently, in an effort to locate a better definition of food poverty, this work draws upon the income thresholds of both poverty and food stamp eligibility as a strategic way to locate those characteristics of food poverty which were significant during the key recession years and recovery.

With the emphasis placed on increasing capacity and capability of individuals in society by improving their access to basic necessities such as: employment, a sustainable and adequate income, as well as education and reputable skills, food poverty measures will help to analyze data and aid improved government

programming providing greater access to programs that empower those dependent on government security nets.

CHAPTER 3

OLS MULTIVARIATE LINEAR PROBABILITY REGRESSION MODEL FOR POVERTY AND FOOD SECURITY ANALYSIS

The model used for this work includes an Ordinary Least Squares Linear Probability Model (OLS LPM) with a ttest. Both the ttest (graphs 1-7) and OLS LPM (Graphs 8-12) use binary dependent variables which allow an analysis of predicted probabilities. These binaries are noted as 1, 0:

$$y_i = \begin{cases} 1 \text{ if Food Bank recipient is poor or food stamp eligible} \\ 0, \qquad \text{Otherwise} \end{cases}$$

y_i is a realization of the random variable Y_i that can take the values one and zero with probabilities π_i and 1- π_i, respectively.

The Ordinary Least Squares Linear Probability estimation was employed to determine the socioeconomic factors that influence food insecurity (food stamp eligibility) and poverty among food bank recipients. The model was specified as:

$$Y = f(X_{1i,}\, X_{2i,} X_{3i,} X_{4i,} X_{5i,} X_{6i,} X_{7i,} X_{8i,} X_{9i,} X_{10i}, X_{11i}, X_{12i}, X_{13i}, X_{14i,} X_{15i}\, X_{16i}\ )$$

The explicit form of the model is:

$$Y_i = \beta_0 + \beta_1 X_{1i} \cdots + X_{ki} + \varepsilon$$

Where:

Y_i =food secure (food stamp ineligible) or not food secure (food stamp eligible) status and poor or non-poor status for observation. $X_1 i$, $X_2 i$, …, $X_k i$ = the k independent variables (gender, employment status, housing, age within groups, household income, food stamp participation, household size, health, education, ethnicity, borough, and Food Bank Program, and year of data) for observation i.

$X_1 i$ =Gender (Female, Male)
$X_2 i$ =Employment Status (employed, unemployed, retired)
X_{3i} =Age (18-24, 25-34, 35-44, 45-54, 55-64, & 65 or older
X_{4i} =Household income per month
X_{5i} =Food Stamp Participation
X_{6i} =Household Size (Households of 1-6 and greater than 7)
X_{7i} =Education
X_{8i} =Race (Black, Asian, White, Hispanic, Other Races)
X_{9i} =Borough (All 5 boroughs)
X_{10i} =SNAP amount received each month
X_{11i} =Housing (own, rent, homeless)
X_{12i} =Food Program (pantry versus soup kitchen)
X_{13i} =Year of data (2007 and 2012)

ε = the error, factor about observation i not included in the model that effectY_i.
β_1 =the slope coefficient on X_1, β_k is the slope coefficient on X_k
β_k=expresses the expected change in Y for a one-unit change in X_k

This report was split into a number of different analyses. Tables 1-7 uses a ttest to analyze different variations of the NYC food bank population during 2007, 2012, then comparing the characteristics over the span of the economic recession, tables 8, 10, and 11 draw variations of the 2007 and 2012 threshold on 2007 and 2012 data. Table 9 includes pooled data for 2007 and 2012 NYC food bank recipients and includes year fixed effects to locate characteristics that were influenced by the recession. Table 12, directly analyzes 2007 and 2012 data sorted by their respective thresholds.

This analysis has two purposes: first, produce poverty and food insecurity characteristics from the New York City 2007 and 2012 Hunger Safety Net survey's which are amenable to policy, and second, analyze the current income thresholds to determine if they accurately measure the need within NYC boroughs spanning five years.

CHAPTER 4

ANALYSIS AND DISCUSSION

Direct Comparison across Recession Years

Results from Tables 1-3 provide a direct relationship comparison from a standard t-test between notable sociodemographic characteristics during the key years before and after the recession, namely 2007 to 2012, and which reliably infer various characteristics of the larger population within NYC. This section explores characteristics most notable among those within the poverty margin, food stamp eligibility margin, and the population who relied upon the food bank regardless of poverty or food insecurity eligibility.

Direct Comparison of Poverty across the Recession Years

Results within Table 1 for those residing within the 2007 poverty margin indicates that this population was more likely to rent an apartment, have minimal education (less than a 12^{th} grade education), reside in Manhattan or Staten Island, attend the soup kitchen more than the food pantry, and be between the ages of 35-44.

In contrast, results within Table 1 for those residing within the 2012 poverty margin indicated that this population was more likely to be white, homeless, participating in food stamps, reside in a household size of 1 to 6 people, have minimal education (the equivalent of a high school degree), reside in the Bronx, or Queens, and attend the food pantry rather than the soup kitchen.

When comparing across years, a number of notable changes between 2007 and 2012 occurred within the population within the poverty margin. It is important to note that although this data was a cross sectional analysis, it did not analyze the same group of people across years, therefore changes across the recession years do not indicate distinct change of specific recipients, only those changes within those attending the food bank as a whole. First, age was significant at a range of ages 35-44 within 2007 but not significant in 2012. Second, in terms of area and place of residence within 2007 this population was more likely to rent an apartment and reside in Manhattan or Staten Island. However, in 2012, this population was more likely to be homeless and residing in the Bronx or Queens. Third, the type of program generally frequented changed from the soup kitchen in 2007 to the food pantry in 2012. While those in 2007 were more frequently those who had obtained less than a 12^{th} grade education, within 2012, those with a degree equivalent to a high school degree were more likely to be in poverty. Within 2007, race was not significant; however in 2012 there was a statistically significant prevalence of those who identified themselves as white. Finally, within the 2012 population, household size was significant for household sizes from 1-6 people, however, within 2007, household size was not considered a significant factor of poverty.

Table 1: Poverty Eligible Direct Comparison of Year 2007 Versus 2012							
	N_1	2007	N_2	2012	Beta	Standard Error	ttest
Female	976	0.533	604	0.558	-0.025	0.026	-0.98
Retired	976	0.171	604	0.175	-0.004	0.02	-0.22
Disabled	976	0.316	604	0.28	0.036	0.024	1.51
Renting Apartment	976	0.875	604	0.752	0.123	0.019	6.39***
Homeless	976	0.114	604	0.152	-0.039	0.017	-2.23*
Age 18 - 24	976	0.018	604	0.022	-0.003	0.007	-0.43
Age 25 - 34	976	0.074	604	0.084	-0.011	0.014	-0.77
Age 35 - 44	976	0.213	604	0.141	0.072	0.02	3.61***
Age 45 - 54	976	0.305	604	0.268	0.037	0.024	1.58
Age 55 - 64	976	0.201	604	0.209	-0.008	0.021	-0.37
Age > 65	976	0.172	604	0.18	-0.008	0.02	-0.42
Household Income per Month	976	87.66	604	585.518	-497.858	18.242	-27.29***
Food Stamp Participation	976	0.517	604	0.639	-0.122	0.026	-4.77***
Household Size of 1	976	0.205	604	0.329	-0.125	0.022	-5.59***
Household Size 2, 3 & 4	976	0.366	604	0.488	-0.123	0.025	-4.84***
Household Size 5 & 6	976	0.074	604	0.132	-0.059	0.015	-3.86***
Household Size >7	976	0.061	604	0.05	0.012	0.012	0.98
Less than 12th grade	946	0.492	573	0.393	0.099	0.026	3.77***
High School Degree Equivalent	946	0.051	573	0.124	-0.073	0.014	-5.19***
Graduated from High School	946	0.215	573	0.204	0.01	0.022	0.48
Some College	946	0.112	573	0.122	-0.01	0.017	-0.6
Bronx	971	0.167	604	0.23	-0.063	0.02	-3.11**
Brooklyn	971	0.306	604	0.316	-0.01	0.024	-0.43
Manhattan	971	0.216	604	0.152	0.064	0.02	3.14**
Queens	971	0.214	604	0.258	-0.044	0.022	-2.02*
Staten Island	971	0.097	604	0.043	0.054	0.014	3.93***
Food Pantry	971	0.684	604	0.768	-0.084	0.023	-3.62***
Soup Kitchen	971	0.316	604	0.232	0.084	0.023	3.62***
Unemployed	976	0.286	604	0.32	-0.034	0.024	-1.42
Black	976	0.469	604	0.488	-0.019	0.026	-0.74
Asian	976	0.027	604	0.02	0.007	0.008	0.85
White	976	0.074	604	0.123	-0.049	0.015	-3.26**
Hispanic	976	0.284	604	0.298	-0.014	0.023	-0.6
Other Races	976	0.051	604	0.043	0.008	0.011	0.74
*** p<0.01, ** p<0.05, * p<0.1							

Direct Comparison of Food Stamp Eligibility across Recession Years

While emphasizing only those who are considered food stamp eligible (food insecure) in 2007[shown in Table 2], my results closely mirrored that of the 2007 poverty population in that this population was more likely to be renting an apartment, have less than a 12th grade education, reside in Manhattan or Staten Island, and attend the soup kitchen rather than the food pantry. In comparison, results within Table 1 for those residing with the 2012 food stamp eligibility margin also closely mirrored that of the 2012 poverty population. This similarity was reflected by those within the 2012 food stamp eligible population were more likely to homeless, disabled, participating in food stamps, come from a household size of anywhere from 1 to 6 people, have the equivalent of a high school degree, reside in the Bronx, more likely to be white and attend the food pantry as opposed to the soup kitchen. However, unlike the 2012 poverty descriptives, those who were food stamp eligible in 2012 were more likely to be unemployed and did not reside in Queens. A number of notable changes between 2007 and 2012 occurred within these populations which were of note. First, within 2012 there was a high prevalence of unemployment among the food stamp eligible population, but not within the 2007 food stamp eligible population. Second, similar to the poverty population between 2007 and 2012 the food stamp population changed residence from renting to homeless and location from Manhattan and Staten Island, to the Bronx.

Table 2: Food Stamp Eligible Direct Comparison of Year 2007 Versus 2012							
	N_1	2007	N_2	2012	Beta	Standard Error	ttest
Female	997	0.53	897	0.554	-0.024	0.023	-1.07
Retired	997	0.171	897	0.184	-0.013	0.018	-0.76
Disabled	997	0.32	897	0.278	0.042	0.021	2.01*
Renting Apartment	997	0.874	897	0.748	0.126	0.018	7.10***
Homeless	997	0.115	897	0.155	-0.04	0.016	-2.53*
Age 18 - 24	997	0.018	897	0.019	-0.001	0.006	-0.14
Age 25 - 34	997	0.072	897	0.096	-0.024	0.013	-1.86
Age 35 - 44	997	0.213	897	0.149	0.063	0.018	3.57***
Age 45 - 54	997	0.307	897	0.268	0.039	0.021	1.89
Age 55 - 64	997	0.203	897	0.213	-0.01	0.019	-0.55
Age > 65	997	0.172	897	0.185	-0.014	0.018	-0.77
Household Income per Month	977	88.935	896	965.66	-876.724	29.522	-29.70***
Food Stamp Participation	997	0.527	897	0.769	-0.243	0.021	-11.36***
Household Size of 1	997	0.201	897	0.347	-0.146	0.02	-7.25***
Household Size 2, 3 & 4	997	0.359	897	0.487	-0.128	0.023	-5.69***
Household Size 5 & 6	997	0.072	897	0.118	-0.046	0.013	-3.43***
Household Size >7	997	0.062	897	0.048	0.014	0.011	1.35
Less than 12th grade	965	0.49	846	0.369	0.121	0.023	5.24***
High School Degree Equivalent	965	0.051	846	0.142	-0.091	0.014	-6.73***
Graduated from High School	965	0.215	846	0.207	0.008	0.019	0.4
Some College	965	0.114	846	0.119	-0.005	0.015	-0.36
Bronx	992	0.166	897	0.213	-0.047	0.018	-2.59**
Brooklyn	992	0.305	897	0.32	-0.015	0.021	-0.68
Manhattan	992	0.221	897	0.168	0.052	0.018	2.87**
Queens	992	0.212	897	0.243	-0.031	0.019	-1.63
Staten Island	992	0.096	897	0.056	0.04	0.012	3.27**
Food Pantry	992	0.681	897	0.775	-0.093	0.02	-4.56***
Soup Kitchen	992	0.319	897	0.225	0.093	0.02	4.56***
Unemployed	997	0.283	897	0.327	-0.044	0.021	-2.07*
Black	997	0.466	897	0.479	-0.013	0.023	-0.56
Asian	997	0.027	897	0.016	0.011	0.007	1.71
White	997	0.076	897	0.13	-0.054	0.014	-3.91***
Hispanic	997	0.281	897	0.288	-0.007	0.021	-0.33
Other Races	997	0.053	897	0.046	0.007	0.01	0.75
*** p<0.01, ** p<0.05, * p<0.1							

Direct Comparison of 2007 versus 2012 Variables

While emphasizing all recipients of the food bank within 2007, my results [in table 3] show that this population was more likely to rent an apartment, have minimal education (obtained less than a 12^{th} grade education), reside in Manhattan or Staten Island, be between the ages of 35-44, and attend the soup kitchen more than the food pantry. In comparison, all recipients of the food bank within 2012 were more likely to be homeless, participating in food stamps, come from a household size of anywhere from 1to 6 people, have the equivalent of a high school degree, reside in the Bronx, or Queens, and were more likely to be white and attend the food pantry as opposed to the soup kitchen.

Notable Comparison across Years without Independent Variables [Table 3]

It is interesting to note that when comparing across years without respect to poverty or food stamp eligibility, characteristics still mirrored significant factors within the poverty population and a number within the food stamp eligibility population inferring that the poverty threshold most closely mirrors the overall food bank recipient population. From this analysis emerges the difference in characteristics among those who are considered in poverty versus food stamp eligible and explains those variables which were selected across programs and which were potentially influenced during the key recession years.

Table 3: Direct Comparison of Year 2007 Versus 2012 Regardless of Status							
	N_1	2007	N_2	2012	Beta	Standard Error	ttest
Female	1192	0.532	1229	0.558	-0.026	0.02	-1.3
Retired	1192	0.18	1229	0.204	-0.024	0.016	-1.49
Disabled	1192	0.297	1229	0.23	0.067	0.018	3.74***
Renting Apartment	1192	0.881	1229	0.737	0.144	0.016	9.12***
Homeless	1192	0.108	1229	0.139	-0.031	0.013	-2.31*
Age 18 - 24	1192	0.019	1229	0.024	-0.004	0.006	-0.73
Age 25 - 34	1192	0.069	1229	0.086	-0.017	0.011	-1.6
Age 35 - 44	1192	0.206	1229	0.149	0.057	0.015	3.71***
Age 45 - 54	1192	0.289	1229	0.251	0.038	0.018	2.11*
Age 55 - 64	1192	0.205	1229	0.221	-0.016	0.017	-0.95
Age > 65	1192	0.189	1229	0.202	-0.013	0.016	-0.81
Household Income per Month	979	94.797	1047	1129.517	-1034.72	33.685	-30.72***
Food Stamp Participation	1192	0.44	1229	0.561	-0.121	0.02	-5.99***
Household Size of 1	1192	0.193	1229	0.322	-0.129	0.018	-7.34***
Household Size 2, 3 & 4	1192	0.383	1229	0.505	-0.123	0.02	-6.12***
Household Size 5 & 6	1192	0.073	1229	0.126	-0.053	0.012	-4.37***
Household Size >7	1192	0.064	1229	0.046	0.017	0.009	1.88
Less than 12th grade	1130	0.489	1164	0.351	0.139	0.02	6.80***
High School Degree Equivalent	1130	0.049	1164	0.131	-0.082	0.012	-6.91***
Graduated from High School	1130	0.212	1164	0.209	0.003	0.017	0.16
Some College	1130	0.116	1164	0.13	-0.014	0.014	-1.01
Bronx	1186	0.153	1229	0.188	-0.035	0.015	-2.25*
Brooklyn	1186	0.304	1229	0.309	-0.005	0.019	-0.26
Manhattan	1186	0.212	1229	0.165	0.046	0.016	2.93**
Queens	1186	0.241	1229	0.276	-0.035	0.018	-1.95
Staten Island	1186	0.089	1229	0.062	0.028	0.011	2.57*
Food Pantry	1186	0.685	1229	0.784	-0.099	0.018	-5.54***
Soup Kitchen	1186	0.315	1229	0.216	0.099	0.018	5.54***
Unemployed	1192	0.272	1229	0.325	-0.053	0.019	-2.84**
Black	1192	0.455	1229	0.478	-0.023	0.02	-1.13
Asian	1192	0.025	1229	0.026	-0.001	0.006	-0.14
White	1192	0.08	1229	0.131	-0.051	0.012	-4.12***
Hispanic	1192	0.267	1229	0.282	-0.015	0.018	-0.81
Other Races	1192	0.055	1229	0.046	0.009	0.009	1.01
*** p<0.01, ** p<0.05, * p<0.1							

Food Poverty Characteristics

From the overall descriptives of both poverty and food security [Tables 4-7] emerge characteristics and a regional understanding of those factors influencing poverty and food security within New York City's boroughs. When looking at food poverty characteristics within NYC t-test results for 2007, key characteristics of food

poverty included, age, household income, those who are currently retired, disabled, participating in food stamps, within a household size of 2, 3, or 4,residing within Manhattan or Queens, and who identify themselves to be Hispanic or Black.

When looking at food poverty characteristics within NYC t-test results for 2012 of both poverty and food stamp eligibility thresholds, it is interesting to note those characteristics which were constant throughout the recession years. These included retirement status, disabilities, household income, and food stamp participation, living within a household size of 2, 3, or 4, and residing within Manhattan or Queens.

In contrast, it is interesting to note those additional characteristics that emerged and changed throughout the recession years. Characteristics of food poverty among NYC residents included those who lived alone, had obtained less than a 12^{th} grade education, those who identified themselves as Asian and resided in Staten Island.

Notable sociodemographic indicators of food poverty emerged among both the 2007 and 2012 populations, including education, age and race. Within 2007 t-test results in Tables 4-7, education was not relevant to their status of food poverty, but in 2012, those with less than a 12^{th} grade education emerged as a significant characteristic of the food bank population. This change in significance is a strong indicator of recession effects. As a result of record high lay off's, increased unemployment, and, therefore, increased competition for employment during the

recession, education became increasingly relevant and important within employment decisions causing those with less than a high school education decreased opportunities for a reliable and livable income.

Within Tables 4-7, age was a significant characteristic of food poverty. Within 2007 descriptives for both food stamps and poverty, significant ages ranged from 46-55 and which was considered both food stamp eligible and in poverty. However, these age groups completely changed for 2012 descriptives. Within 2012 food stamp eligibility, ages included ranges from 26-35 and 46-55(both groups were eligible for food stamps). In contrast, 2012 poverty age ranges, as shown in Table 7, did not show significance for poverty eligibility.

Additionally, race also contributed to the food poverty definition within Table 5 (poverty definition) but not within the 2007 results for food stamp eligibility. Within 2007 poverty t-test results, both those who identified themselves as black and Hispanic were statistically significant within food poverty characteristics. In contrast, 2012 results showed both black and Hispanic races were replaced by those who identified themselves as Asian as statistically significant.

Overall, these key characteristics of food poverty contribute four significant findings to literature. First, they show those variables that were consistent over the recession years which are amenable by policy. Second, these results support my argument that there are multiple factors that are influencing poverty and food insecurity which cannot be easily determined by income alone. Third, the current income measure does not account for the actual need and thus changing to an

expenditure model could possibly provide improved accuracy. Fourth, these results provide food poverty characteristics which could aid a new food poverty definition for improved support and accuracy in meeting those needs within NYC vulnerable population.

Table 4: Descriptives for 2007 Food Stamp Eligibility							
	N_1	Not Food Stamp Eligible	N_2	Food Stamp Eligible	Beta	Standard Error	ttest
Female	195	0.544	997	0.53	0.014	0.039	0.36
Retired	195	0.231	997	0.171	0.06	0.03	2.00*
Disabled	195	0.179	997	0.32	-0.14	0.036	-3.95***
Rent	195	0.918	997	0.874	0.044	0.025	1.75
Homeless	195	0.072	997	0.115	-0.044	0.024	-1.79
Age 18-25	195	0.026	997	0.018	0.008	0.011	0.7
Age 26-35	195	0.051	997	0.072	-0.021	0.02	-1.06
Age 36-45	195	0.174	997	0.213	-0.038	0.032	-1.21
Age 46-55	195	0.2	997	0.307	-0.107	0.035	-3.02**
Age 56-65	195	0.215	997	0.203	0.013	0.032	0.4
Age> 65	195	0.333	997	0.188	0.146	0.032	4.60***
Household income per month	2	2958.333	977	88.935	2869.398	87.334	32.86***
Participates in Food Stamps	195	0	997	0.527	-0.527	0.036	-14.72***
Household Size of 1	195	0.154	997	0.201	-0.047	0.031	-1.51
Household Size of 2, 3, and 4	195	0.503	997	0.359	0.143	0.038	3.79***
Household Size of 5 and 6	195	0.077	997	0.072	0.005	0.02	0.23
Household Size of >7	195	0.072	997	0.062	0.01	0.019	0.5
Less than a 12th grade education	165	0.485	965	0.49	-0.005	0.042	-0.13
High School Degree Equivelant (GED)	165	0.036	965	0.051	-0.014	0.018	-0.79
Graduated from High School	165	0.194	965	0.215	-0.021	0.034	-0.6
Completed some college	165	0.127	965	0.114	0.013	0.027	0.49
Bronx	194	0.088	992	0.166	-0.079	0.028	-2.79**
Brooklyn	194	0.299	992	0.305	-0.006	0.036	-0.18
Manhattan	194	0.165	992	0.221	-0.056	0.032	-1.74
Queens	194	0.392	992	0.212	0.18	0.033	5.42***
Staten Island	194	0.057	992	0.096	-0.039	0.022	-1.75
Food Pantry	194	0.706	992	0.681	0.025	0.036	0.68
Soup Kitchen	194	0.294	992	0.319	-0.025	0.036	-0.68
Black	195	0.395	997	0.466	-0.072	0.039	-1.84
Asian	195	0.015	997	0.027	-0.012	0.012	-0.95
White	195	0.097	997	0.076	0.021	0.021	1
Hispanic	195	0.195	997	0.281	-0.086	0.035	-2.49*
Other races	195	0.067	997	0.053	0.014	0.018	0.75
*** p<0.01, ** p<0.05, * p<0.1							

Table 5: Descriptives for 2007 Poverty Guidelines							
	N_1	Not in Poverty	N_2	Poverty Eligible	Beta	Standard Error	ttest
Female	216	0.528	976	0.533	-0.005	0.038	-0.13
Retired	216	0.222	976	0.171	0.051	0.029	1.77
Disabled	216	0.213	976	0.316	-0.103	0.034	-3.00**
Rent	216	0.907	976	0.875	0.032	0.024	1.33
Homeless	216	0.083	976	0.114	-0.03	0.023	-1.3
Age 18-25	216	0.023	976	0.018	0.005	0.01	0.45
Age 26-35	216	0.046	976	0.074	-0.027	0.019	-1.44
Age 36-45	216	0.176	976	0.213	-0.037	0.03	-1.22
Age 46-55	216	0.218	976	0.305	-0.088	0.034	-2.58*
Age 56-65	216	0.222	976	0.201	0.021	0.03	0.7
Age> 65	216	0.315	976	0.189	0.126	0.031	4.14***
Household income per month	3	2416.667	976	87.66	2329.006	71.847	32.42***
Participates in Food Stamps	216	0.093	976	0.517	-0.425	0.035	-12.04***
Household Size of 1	216	0.139	976	0.205	-0.066	0.03	-2.23*
Household Size of 2, 3, and 4	216	0.458	976	0.366	0.093	0.036	2.54*
Household Size of 5 and 6	216	0.069	976	0.074	-0.004	0.02	-0.22
Household Size of >7	216	0.074	976	0.061	0.013	0.018	0.69
Less than a 12th grade education	184	0.478	946	0.492	-0.013	0.04	-0.33
High School Degree Equivelant (GED)	184	0.038	946	0.051	-0.013	0.017	-0.73
Graduated from High School	184	0.196	946	0.215	-0.019	0.033	-0.58
Completed some college	184	0.136	946	0.112	0.024	0.026	0.92
Bronx	215	0.093	971	0.167	-0.074	0.027	-2.72**
Brooklyn	215	0.298	971	0.306	-0.008	0.035	-0.24
Manhattan	215	0.191	971	0.216	-0.026	0.031	-0.83
Queens	215	0.363	971	0.214	0.149	0.032	4.65***
Staten Island	215	0.056	971	0.097	-0.041	0.021	-1.91
Food Pantry	215	0.693	971	0.684	0.009	0.035	0.26
Soup Kitchen	215	0.307	971	0.316	-0.009	0.035	-0.26
Black	216	0.389	976	0.469	-0.08	0.037	-2.15*
Asian	216	0.019	976	0.027	-0.008	0.012	-0.69
White	216	0.106	976	0.074	0.033	0.02	1.61
Hispanic	216	0.19	976	0.284	-0.094	0.033	-2.83**
Other races	216	0.074	976	0.051	0.023	0.017	1.33
*** p<0.01, ** p<0.05, * p<0.1							

Table 6: Descriptives of 2012 Food Stamp Eligibility							
	N_1	Not Food Stamp Eligible	N_2	Food Stamp Eligible	Beta	Standard Error	ttest
Female	332	0.569	897	0.554	0.015	0.032	0.48
Retired	332	0.259	897	0.184	0.075	0.026	2.91**
Disabled	332	0.102	897	0.278	-0.175	0.027	-6.59***
Rent	332	0.708	897	0.748	-0.04	0.028	-1.42
Homeless	332	0.096	897	0.155	-0.059	0.022	-2.64**
Age 18-25	332	0.036	897	0.019	0.017	0.01	1.76
Age 26-35	332	0.06	897	0.096	-0.036	0.018	-1.98*
Age 36-45	332	0.148	897	0.149	-0.002	0.023	-0.08
Age 46-55	332	0.208	897	0.268	-0.06	0.028	-2.15*
Age 56-65	332	0.241	897	0.213	0.028	0.027	1.05
Age> 65	332	0.307	897	0.255	0.052	0.028	1.82
Household income per month	151	2101.812	896	965.66	1136.153	84.484	13.45***
Participates in Food Stamps	332	0	897	0.769	-0.769	0.023	-33.24***
Household Size of 1	332	0.256	897	0.347	-0.091	0.03	-3.03**
Household Size of 2, 3, and 4	332	0.554	897	0.487	0.067	0.032	2.09*
Household Size of 5 and 6	332	0.148	897	0.118	0.029	0.021	1.38
Household Size of >7	332	0.042	897	0.048	-0.006	0.014	-0.43
Less than a 12th grade education	318	0.302	846	0.369	-0.067	0.031	-2.13*
High School Degree Equivelant (GED)	318	0.101	846	0.142	-0.041	0.022	-1.86
Graduated from High School	318	0.214	846	0.207	0.007	0.027	0.26
Completed some college	318	0.157	846	0.119	0.038	0.022	1.71
Bronx	332	0.12	897	0.213	-0.092	0.025	-3.70***
Brooklyn	332	0.28	897	0.32	-0.04	0.03	-1.34
Manhattan	332	0.157	897	0.168	-0.012	0.024	-0.49
Queens	332	0.364	897	0.243	0.121	0.029	4.26***
Staten Island	332	0.078	897	0.056	0.023	0.015	1.46
Food Pantry	332	0.81	897	0.775	0.035	0.026	1.34
Soup Kitchen	332	0.19	897	0.225	-0.035	0.026	-1.34
Black	332	0.473	897	0.479	-0.006	0.032	-0.2
Asian	332	0.054	897	0.016	0.039	0.01	3.79***
White	332	0.133	897	0.13	0.002	0.022	0.1
Hispanic	332	0.265	897	0.288	-0.023	0.029	-0.78
Other races	332	0.048	897	0.046	0.002	0.014	0.18
*** p<0.01, ** p<0.05, * p<0.1							

Table 7: Descriptives for 2012 Poverty Guidelines							
	N_1	Not in Poverty	N_2	Poverty Eligible	Beta	Standard Error	ttest
Female	625	0.558	604	0.558	0	0.028	0.02
Retired	625	0.232	604	0.175	0.057	0.023	2.46*
Disabled	625	0.182	604	0.28	-0.097	0.024	-4.08***
Rent	625	0.723	604	0.752	-0.028	0.025	-1.13
Homeless	625	0.126	604	0.152	-0.026	0.02	-1.31
Age 18-25	625	0.026	604	0.022	0.004	0.009	0.47
Age 26-35	625	0.088	604	0.084	0.004	0.016	0.22
Age 36-45	625	0.157	604	0.141	0.016	0.02	0.79
Age 46-55	625	0.235	604	0.268	-0.033	0.025	-1.33
Age 56-65	625	0.232	604	0.209	0.023	0.024	0.99
Age> 65	625	0.262	604	0.276	-0.014	0.025	-0.56
Household income per month	443	1871.223	604	585.518	1285.705	51.495	24.97***
Participates in Food Stamps	625	0.486	604	0.639	-0.153	0.028	-5.45***
Household Size of 1	625	0.315	604	0.329	-0.014	0.027	-0.53
Household Size of 2, 3, and 4	625	0.522	604	0.488	0.033	0.029	1.16
Household Size of 5 and 6	625	0.12	604	0.132	-0.012	0.019	-0.66
Household Size of >7	625	0.043	604	0.05	-0.006	0.012	-0.54
Less than a 12th grade education	591	0.31	573	0.393	-0.083	0.028	-2.98**
High School Degree Equivelant (GED)	591	0.137	573	0.124	0.013	0.02	0.67
Graduated from High School	591	0.213	573	0.204	0.009	0.024	0.38
Completed some college	591	0.137	573	0.122	0.015	0.02	0.76
Bronx	625	0.147	604	0.23	-0.083	0.022	-3.74***
Brooklyn	625	0.302	604	0.316	-0.014	0.026	-0.52
Manhattan	625	0.178	604	0.152	0.025	0.021	1.19
Queens	625	0.293	604	0.258	0.035	0.026	1.35
Staten Island	625	0.08	604	0.043	0.037	0.014	2.69**
Food Pantry	625	0.8	604	0.768	0.032	0.023	1.35
Soup Kitchen	625	0.2	604	0.232	-0.032	0.023	-1.35
Black	625	0.467	604	0.488	-0.021	0.029	-0.74
Asian	625	0.032	604	0.02	0.012	0.009	1.34
White	625	0.139	604	0.123	0.017	0.019	0.87
Hispanic	625	0.266	604	0.298	-0.032	0.026	-1.26
Other races	625	0.05	604	0.043	0.007	0.012	0.55
*** p<0.01, ** p<0.05, * p<0.1							

In an effort to further define food poverty characteristics, these significant variables were tested within an OLS multivariate regression in four key models. The first model [Table 8] tests significant variables of poverty and food stamp eligibility with a pooled dataset from both 2007 and 2012. The second analysis [Table 9], tests the poverty and food stamp eligibility estimation of recession effects over the span of 2007 and 2012, testing with year-specific threshold and fixed year effects. The third and fourth graphs [Tables 10 and 11] test first the 2007 threshold on both 2012 and 2007 data, then the 2012 data filtered by the 2007 and 2012 thresholds for a further understanding of how the threshold influences the population measures of food stamp eligibility and poverty.

When reading these tables it is important to note a number of characteristics involved in the data collection and analysis. First, the data was drawn from recipients relying upon either the soup kitchens or food pantries at the time of survey dissemination. Second, all recipients of the New York City Food Bank who fell under the poverty line were divided into groups of poor versus non poor(in poverty versus not in poverty) as well as food stamp eligibility(food insecure) versus food stamp ineligible (food secure). Third, because the food bank does not regulate nor require specific qualifications to draw upon their resources, this sample is representative of the population relying upon the food bank and accurately portrays those who are legitimately relying upon these resources because of a distinct reliance for this kind of safety net.

Due to the reporting nature of the survey and the distance and location of food banks, such results could be biased towards those able and, or willing to attend the food bank (implying those not able to attend the NYC Food Bank would be those suffering from maladies which impair their ability to attend the food bank or regardless of need are not willing to attend), this could also be called exclusion error. Overall, this sample provides an interesting face to the food poverty within New York City and a potential new definition or measure of the validity of the current income threshold used within the current poverty and food stamp thresholds.

Tables 8, 10, and 11 analyzed threshold impacts on the food bank population. It is important to note that due to the insignificant findings drawn from this analysis, these graphs were moved to the appendix A, B, and C on page 50-53. However, findings within these graphs care still interesting and can provide an interesting look at how income thresholds influence food bank data.

Recession Effects on Food Bank Population [Table 9]

Within Table 9, data for 2007 and 2012 were pooled and analyzed to determine those characteristics most common among the food bank population regardless of year. By looking at those characteristics that were significant and constant among the food bank population across the recession years, we may draw an understanding of those common characteristics which are amenable to policy. It is important to note that each independent variable was analyzed subject to a missing variable such as those who rent are compared to those who do not rent and those who are homeless are compared to those who are not homeless.

A number of significant factors emerged for both food stamp eligibility and poverty populations. First, those renting an apartment were 7.6 percentage points more likely to be food stamp eligible or 73.1 percentage points more likely to be poverty eligible than those who did not rent. Those with less than a 12^{th} grade education were 4.1 percentage points more likely to be food stamp eligible and 4.5 percentage points more likely poverty eligible than those with some college. Those residing in the Bronx were 6.1 percentage points more likely to be food stamp eligible and 10 percentage points more likely to be poverty eligible than those who live in Manhattan. Thos also who reside within Brooklyn are 3.7 percentage points more likely to be food stamp eligible and 4.4 percentage points more likely to be poverty eligible than those who reside in Manhattan.

Table 9: Recession Effects-Pooled Data		
	2007 & 2012 Data Pooled	2007 & 2012 Data Pooled
	Food Stamp Eligible	Poverty Eligible
Female	-0.00672	0.00793
	(0.0149)	(0.0191)
Retired	0.00683	-0.0340
	(0.0261)	(0.0322)
Disabled	0.0106	0.0352
	(0.0157)	(0.0218)
Rent	0.0761**	0.0718*
	(0.0326)	(0.0407)
Homeless	0.0945**	0.0927**
	(0.0367)	(0.0470)
Age 25-35	0.00257	-0.0200
	(0.0502)	(0.0632)
Age 35-45	-0.0281	-0.0319
	(0.0474)	(0.0584)
Age 45-55	-0.00766	0.00313
	(0.0464)	(0.0572)
Age 55-65	-0.0298	-0.0380
	(0.0481)	(0.0590)
Age > 65	-0.0432	-0.0195
	(0.0506)	(0.0624)
Food Stamp Participation	0.435***	0.181***
	(0.0153)	(0.0187)
Household Size 2, 3 & 4	-0.0472***	-0.0347
	(0.0169)	(0.0214)
Household Size 5 & 6	-0.0353	0.0130
	(0.0272)	(0.0341)
Household Size <7	-0.0196	-0.0167
	(0.0316)	(0.0414)
Less than 12th grade	0.0418**	0.0458**
	(0.0180)	(0.0226)
High School Degree Equivalent	0.0559**	0.00119
	(0.0257)	(0.0365)
Graduated from High School	0.0522**	0.0392
	(0.0210)	(0.0263)
Bronx	0.0618***	0.102***
	(0.0211)	(0.0291)
Brooklyn	0.0379*	0.0447*
	(0.0198)	(0.0263)
Queens	0.0153	0.0223
	(0.0226)	(0.0287)
Staten Island	0.0249	0.00996
	(0.0288)	(0.0369)
Food Pantry	-0.00772	-0.00958
	(0.0170)	(0.0217)
Black	-0.00262	0.0571*
	(0.0242)	(0.0309)
Asian	0.0217	0.0908
	(0.0545)	(0.0639)
White	-0.0414	0.0137
	(0.0309)	(0.0406)
Hispanic	0.00453	0.0649**
	(0.0256)	(0.0331)
Year 2012	-0.156***	-0.350***
	(0.0156)	(0.0195)
Constant	0.570***	0.596***
	(0.0614)	(0.0756)
Observations	2,288	2,288
R-squared	0.339	0.197
Robust standard errors in parentheses		
*** p<0.01, ** p<0.05, * p<0.1		
Ommited Reference Variables: Age >25, Household Size of 1, Some College, Manhattan, Soup Kitchen		

Direct Analysis of 2007 and 2012 Food Bank Populations [Table 12]

In addition to the direct comparison displayed within Tables 1-3, Table 12 displays those characteristics which emerge from the NYC food bank population who have already been sorted based on household size and income for food stamp eligibility or poverty eligibility. This direct analysis is interesting because significant characteristics emerged among the different categories.

Within the 2007 food stamp eligibility and poverty results those factors that emerged as significant and were significant across both those eligible for food stamps and those who are poverty eligible. These factors included age ranges of those who were 65 years old or older were 1.3 percentage points less likely to be food stamp eligible or 1.4 percentage points less likely to be poverty eligible than those who were of any other age group. Those within a household of 2-4 were 7.5 percentage points less likely to be food stamp eligible in 2007 and 5.8 percentage points less likely to be poverty eligible in 2007 and 3.9 percentage points less likely to be food stamp eligible in 2012 than those of a household size of 1. Those who resided in Staten Island were 7.1 percentage points more likely to be food stamp eligible and 8.5 percentage points more likely to be poverty eligible than those who live in Manhattan. Finally, those who identified themselves as Asian were 1.5 percentage points more likely to be food stamp eligible and 1.3 percentage points more likely to be poverty eligible than those who were not Asian.

Within the 2012 NYC food bank population, similarities among the dependent variables were less pronounced. Food stamp participation, education level and residence in the Bronx were the only similarities. It is interesting to note that education

was not significant within the 2007 population, however emerged as significant within the 2012 population. Results showed that those with less than a 12th grade education were 5.7 percentage points more likely to be food stamp eligible and 7.8 percentage points more likely to be poverty eligible than those with some college. In addition to education, those who resided within the Bronx and who were relying upon the food bank were 5.3 percentage points more likely to be food stamp eligible and 1.5 percentage points more likely to be poverty eligible than those who reside in Manhattan and are relying upon the food bank.

It is also interesting to note that within the 2012 NYC food bank population, food stamp eligible populations displayed significance among varying education levels. In addition to those with less than a 12th grade education, those with a high school degree equivalent were 5.7 percentage points more likely and those who graduated from high school were 6 percentage points more likely to be food stamp eligible than those with some college and who are relying upon the food bank.

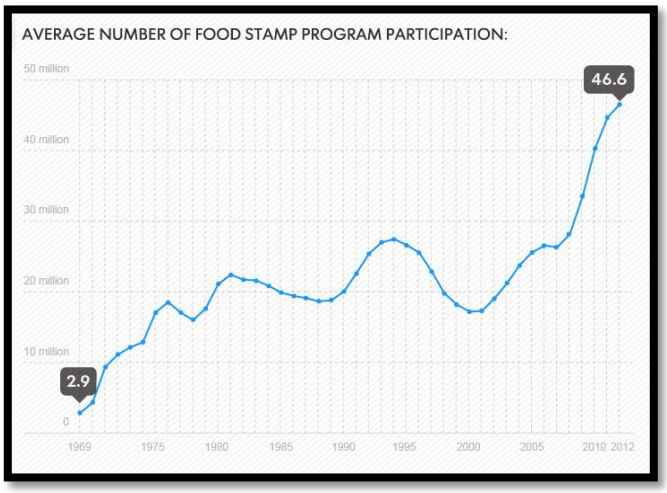
In addition to the 2012 NYC food stamp eligible population characteristics, the 2012 NYC Poverty eligible population showed a higher significance of those who were disabled, renting, homeless, and those who identified themselves as black. When analyzing closer, results showed that those who were disabled and were relying upon the food bank were 8.5 percentage points more likely to be poverty eligible than those who were not disabled, 7.9 percentage points more likely to be renting than those who do not rent, and 1 percentage point more likely to be homeless relative to those who are not homeless and relying upon the food bank.

The only characteristic that was common among all four food bank populations was the food stamp participation. Those relying upon the food bank in 2007 were 2.4 percentage points more likely to be food stamp eligible and 2.1 percentage points more likely to be poverty eligible and those in 2012 and who were also relying upon the food bank were 6.2 percentage points more likely to be food stamp eligible and 1.4 percentage points more likely to be poverty eligible than those who are not currently participating in food stamps.

This direct comparison further contributes to literature the dynamic nature of the food bank population as well as the differences across thresholds and even across years within the food bank population.

From these findings emerged a number of issues that ought to be addressed by policy circles or additional research. First, this direct comparison across the key years of the recession has shown areas that would benefit by additional research. For instance, the impacts of the recession on renters could produce an interesting understanding to why characteristics of poverty and food insecurity notably changed from renting in 2007 to homelessness in 2012. Moreover, educational level changed significance throughout the recession from insignificant in 2007 to very significant within both food stamp and poverty eligibility in 2012 and could contribute to improved poverty reduction by understanding potential correlates. As well as additional research analyzing why race changed from those who identified themselves as Asian in 2007 within poverty and food stamp eligibility to those who identified themselves as Black within the 2012 poverty eligible population.

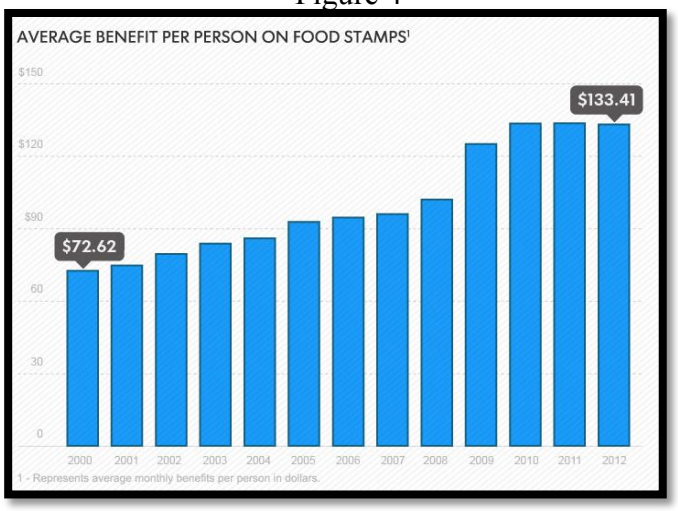
Figure 3



Source: Kepple & Loehrke, The Pew Charitable Trusts, U.S. Department of Agriculture

Second, when looking at the impact of residence on poverty and food stamp eligibility, and the notable variation that exists even within boroughs of New York City, it is surprising that the current income threshold does not account for this variability. The current measures do update yearly for inflation, using the consumer price index (CPI), however this is inaccurate because the bundle of goods that is compiled to estimate CPI has different price points depending on state, city, even borough. When this measure of one bundle of goods adjusts the thresholds for inflation, it does not account for regional differences and as a consequence, the purchasing power of food stamps is greater or smaller as a result of residence resulting in an inaccurate and inefficient distribution of SNAP benefits. Because the SNAP program is such a significant portion of the farm bill and has reached an estimated cost of 46.6 billion dollars(see figure 3), it has also become unmanageable due to its sheer size and magnitude; as a consequence, current measures were created to provide the quickest eligibility, but not necessarily the most accurate

Figure 4



Source: Kepple & Loehrke, The Pew Charitable Trusts, U.S. Department of Agriculture

(Kepple, 2013).

Third, in addition, the SNAP program in the past 83 years has consistently increased in the rate of those reliant upon food stamps(see figure 4); consequently, an improved measure is needed for greater efficiency and regulation of this humanitarian effort. In order to provide an improved measure with greater accuracy of total need, an actual standard of living measure unique to region needs to be created and universally accepted among government entities for improved measurement of regional differences and improved allocation of the food stamp budget. If this regional standard of living measure were calculated by local government entities on a yearly basis for improved accuracy of distribution, then waste of food stamps and poverty benefits would significantly decrease, and provide greater oversight of the total need.

Fourth, in addition to changing the way the current measure is updated, my results display the inaccuracy of an income based threshold. Although this measure is a good basis, a better measure would be to consider actual expenditures and current assets within households with close and continual regulatory oversight of those relying upon welfare resources. As a result, this measure would account for the displayed food poverty characteristics represented throughout this work.

Fifth, current food stamp statistics have shown that the SNAP program, originally meant to be a short term solution, has become a long-standing solution for food insecurity, and a generational crutch. Consequently, in order to mitigate the ongoing negative realities of the SNAP program, an increased focus on continual mentoring, financial counseling, and personal expenditure accountability of those who

have relied upon food stamps for generations, could aid the reduction of these resources and further empower those reliant upon the system to change their circumstances. Within my results, the change in characteristics over time support that one income threshold is not enough to account for the large number of variables impacting food security and poverty and thus a multivariate emphasis ought to be placed on the current programs for improved efficiency and recipient empowerment.

Finally, this paper has addressed whether or not the current income threshold for poverty and food stamp eligibility are still valid and the areas of concern within the measures that ought to be addressed for improved accuracy, efficiency, and a decrease in economic waste. Unfortunately, as a result of the extensive nature of the program, for real change and a significant impact to occur, a number of foundational policies within the current welfare and food stamp system would need to be redefined. For instance, the food stamp program, welfare, and food bank programs began as emergency related programs and were not meant to become a generational crutch. However, when term limits were removed from the program, these welfare programs' definitions were changed from emergency to long term support for those who have relied upon these resources from their infancy. If the underlying goal of the program is to truly decrease the exponential expense of the program while still meeting the need, policy makers would need to reinstitute term limits.

Albeit term limits are considered somewhat unrealistic, because term limits ultimately impact those most vulnerable within these populations or, in other words, children. Current programming is sufficient to support the reimplementation of term limits, though it could benefit from pilot programs to improve efficiency. Additional

areas to be explored include the efficiency of school lunch, after school and weekend programs; whether these programs could be a viable option for feeding vulnerable children in a way that would allow children to maintain an adequate diet.

Additional research is needed to determine whether term limits coupled with a strong focus on financial counseling and accountability measures could be instilled within current programming to allow a gradual individual empowerment and accountability. Pilot programming evaluating poverty conditions based on actual expenditures and assets could also be a valuable and efficient way of determining poverty and food stamp eligibility. Finally, evaluating spending habits through analysis of grocery store receipts targeting SNAP expenditures could lend some notable understanding into the efficiency of the program and opportunities for improvement in counseling, education and nutrition programming.

The direct comparison, emergence of significant characteristics, and threshold analysis have provided strong support that alternative measures are needed and that current programming could benefit from additional research and changes to the foundational definitions within current programming for improved long term program and economic efficiency.

Table 12: 2007 & 2012 Direct Analysis				
	Food Stamp Eligible	Poverty Eligible	Food Stamp Eligible	Poverty Eligible
	2007 Threshold	2007 Threshold	2012 Threshold	2012 Threshold
	2007 Data	2007 Data	2012 Data	2012 Data
Female	0.00808	0.0120	-0.0155	0.0156
	(0.0207)	(0.0226)	(0.0201)	(0.0306)
Retired	0.0522	0.0488	-0.0540	-0.101**
	(0.0384)	(0.0399)	(0.0342)	(0.0480)
Disabled	-0.000836	-0.00734	0.0210	0.0853**
	(0.0215)	(0.0237)	(0.0206)	(0.0375)
Rent	0.0353	0.00698	0.0428	0.0794*
	(0.0825)	(0.0850)	(0.0342)	(0.0451)
Homeless	0.0555	0.0257	0.0490	0.107*
	(0.0841)	(0.0870)	(0.0410)	(0.0580)
Age 25-35	-0.00167	0.000361	0.0183	-0.00747
	(0.0803)	(0.0812)	(0.0587)	(0.0905)
Age 35-45	-0.0231	-0.0331	-0.00898	-0.0267
	(0.0750)	(0.0765)	(0.0563)	(0.0843)
Age 45-55	0.00497	-0.00647	0.00156	0.0286
	(0.0746)	(0.0757)	(0.0542)	(0.0804)
Age 55-65	-0.0475	-0.0591	0.0190	-0.0159
	(0.0774)	(0.0788)	(0.0567)	(0.0820)
Age > 65	-0.139*	-0.145*	0.0836	0.0996
	(0.0823)	(0.0839)	(0.0601)	(0.0865)
Food Stamp Participation	0.248***	0.217***	0.620***	0.147***
	(0.0188)	(0.0207)	(0.0227)	(0.0312)
Household Size 2, 3 & 4	-0.0759***	-0.0582**	-0.0395*	-0.0179
	(0.0239)	(0.0251)	(0.0228)	(0.0351)
Household Size 5 & 6	-0.0584	-0.0354	-0.0104	0.0377
	(0.0386)	(0.0396)	(0.0357)	(0.0503)
Household Size <7	-0.0365	-0.0434	-0.00425	-0.0124
	(0.0391)	(0.0461)	(0.0482)	(0.0711)
Less than 12th grade	0.0131	0.0144	0.0574**	0.0781**
	(0.0256)	(0.0272)	(0.0238)	(0.0363)
High School Degree Equivalent	0.0233	0.0265	0.0572*	-0.00485
	(0.0474)	(0.0514)	(0.0295)	(0.0477)
Graduated from High School	0.0351	0.0320	0.0607**	0.0436
	(0.0298)	(0.0318)	(0.0277)	(0.0410)
Bronx	0.0444	0.0528	0.0513*	0.152***
	(0.0290)	(0.0323)	(0.0292)	(0.0487)
Brooklyn	0.0242	0.0335	0.0351	0.0740
	(0.0269)	(0.0294)	(0.0272)	(0.0453)
Queens	-0.0237	-0.0133	0.0316	0.0724
	(0.0324)	(0.0341)	(0.0292)	(0.0464)
Staten Island	0.0714**	0.0852**	-0.0364	-0.0758
	(0.0357)	(0.0398)	(0.0392)	(0.0656)
Food Pantry	0.0188	0.0257	-0.0312	-0.0553
	(0.0230)	(0.0245)	(0.0240)	(0.0377)
Black	0.0175	0.0354	0.0111	0.0926*
	(0.0325)	(0.0358)	(0.0328)	(0.0523)
Asian	0.152**	0.136*	-0.0791	0.0809
	(0.0595)	(0.0702)	(0.0741)	(0.104)
White	-0.0469	-0.0531	-0.0167	0.0796
	(0.0474)	(0.0522)	(0.0395)	(0.0621)
Hispanic	0.0332	0.0552	0.0166	0.0999*
	(0.0347)	(0.0383)	(0.0348)	(0.0556)
Constant	0.707***	0.708***	0.300***	0.162
	(0.114)	(0.117)	(0.0721)	(0.104)
Observations	1,124	1,124	1,164	1,164
R-squared	0.181	0.135	0.507	0.075
Robust standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				
Ommited Reference Variables: Age >25, Household Size of 1, Some College, Manhattan, Soup Kitchen				

CHAPTER 5

CONCLUSION

This work produced significant poverty and food insecurity characteristics from the New York City Food Bank 2007 and 2012 Hunger Safety Net Surveys providing a greater understanding of the NYC population and those factors which influence their poverty and food insecurity status. These characteristics included education level, area of residence, age, household size, food stamp participation, and race. These characteristics show that the food bank population is dynamic and even changes in significance over time thus current measures ought to account for this dynamic nature to accurately meet the current need and could benefit by using an expenditure model which accounts for these dynamic variables.

This work also used these characteristics to understand how the recession influenced the population relying upon the food bank in NYC. These results found that age range changed from middle age recipients, to elderly, race changed from Asian to Black, area of residence changed from Queens to the Bronx, housing changed significance from renting to homeless, and program participation changed from soup kitchen participation in 2007 to food pantry participation in 2012. These characteristics are amenable to policy and could be instrumental in the creation of a new food poverty measure.

Finally, this work addressed, through testing variations of the poverty and food stamp eligibility thresholds upon household data, whether or not the income threshold could benefit from an improved definition. The results showed that in most of the

comparisons, changes from the 2007 threshold to the 2012 threshold yielded only a .001 difference or less, not significant enough to impact the results or account for a larger population of those in need, and therefore, showing the minimal effect of the income threshold on the 2007 and 2012 data.

As a result of the exponential growth of the food stamp and welfare programs and the recent evaluation of the U.S. Farm Bill, food stamp and welfare programs have taken the main stage in policy discussions. Division of opinion and perspective have resulted in an $8.6 billion dollar cut to the food stamp program further influencing the demand on local food banks to help supplement the need that is not met through federal programs. The results derived from this work are timely and relevant. They promote the consideration of the dynamic nature of the NYC food bank population, support future research of a more inclusive measure involving these characteristics, as well as provides additional influencers to poverty and food insecurity that are amendable to policy. Overall, this work aims to improve current measures, thereby improving efficiency, and thereby supporting the original intent of our Food Stamp, Welfare, and Food Bank Programs, to provide emergency support to America's most vulnerable populations.

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APPENDIX

Appendix A

Table 8: Pooled Data with Fixed Year by Threshold				
	Food Stamp Eligible	Poverty Eligible	Food Stamp Eligible	Poverty Eligible
	2007 Threshold	2007 Threshold	2012 Threshold	2012 Threshold
	2012 Data	2012 Data	2012 Data	2012 Data
Female	-0.00297	0.00331	-0.00615	0.00793
	(0.0149)	(0.0191)	(0.0149)	(0.0191)
Retired	-0.0134	-0.0396	0.00866	-0.0340
	(0.0262)	(0.0322)	(0.0261)	(0.0322)
Disabled	0.0118	0.0362*	0.0108	0.0352
	(0.0155)	(0.0219)	(0.0157)	(0.0218)
Rent	0.0856***	0.0650	0.0763**	0.0718*
	(0.0329)	(0.0406)	(0.0326)	(0.0407)
Homeless	0.0964***	0.0849*	0.0952***	0.0927**
	(0.0370)	(0.0469)	(0.0367)	(0.0470)
Age 25-35	0.0162	-0.0241	0.00246	-0.0200
	(0.0503)	(0.0630)	(0.0502)	(0.0632)
Age 35-45	-0.0113	-0.0372	-0.0284	-0.0319
	(0.0475)	(0.0582)	(0.0474)	(0.0584)
Age 45-55	0.0168	-0.00566	-0.00767	0.00313
	(0.0465)	(0.0571)	(0.0464)	(0.0572)
Age 55-65	-0.0171	-0.0423	-0.0303	-0.0380
	(0.0482)	(0.0588)	(0.0481)	(0.0590)
Age > 65	-0.0182	-0.0244	-0.0425	-0.0195
	(0.0506)	(0.0623)	(0.0505)	(0.0624)
Food Stamp Participation	0.404***	0.182***	0.435***	0.181***
	(0.0153)	(0.0186)	(0.0153)	(0.0187)
Household Size 2, 3 & 4	-0.0319*	-0.0349	-0.0461***	-0.0347
	(0.0169)	(0.0214)	(0.0169)	(0.0214)
Household Size 5 & 6	-0.0304	0.00264	-0.0351	0.0130
	(0.0273)	(0.0340)	(0.0272)	(0.0341)
Household Size >7	-0.0326	-0.0223	-0.0197	-0.0167
	(0.0313)	(0.0413)	(0.0316)	(0.0414)
Less than 12th grade	0.0401**	0.0451**	0.0399**	0.0458**
	(0.0181)	(0.0226)	(0.0180)	(0.0226)
High School Degree Equivalent	0.0602**	2.95e-05	0.0545**	0.00119
	(0.0256)	(0.0365)	(0.0257)	(0.0365)
Graduated from High School	0.0621***	0.0366	0.0504**	0.0392
	(0.0210)	(0.0263)	(0.0210)	(0.0263)
Bronx	0.0572***	0.101***	0.0618***	0.102***
	(0.0210)	(0.0292)	(0.0211)	(0.0291)
Brooklyn	0.0411**	0.0432	0.0380*	0.0447*
	(0.0198)	(0.0263)	(0.0198)	(0.0263)
Queens	0.0124	0.0268	0.0167	0.0223
	(0.0226)	(0.0287)	(0.0226)	(0.0287)
Staten Island	0.0170	0.0166	0.0251	0.00996
	(0.0292)	(0.0368)	(0.0288)	(0.0369)
Food Pantry	-0.00685	-0.0106	-0.00755	-0.00958
	(0.0170)	(0.0217)	(0.0170)	(0.0217)
Black	0.00284	0.0567*	-0.00603	0.0571*
	(0.0243)	(0.0309)	(0.0241)	(0.0309)
Asian	0.0637	0.0772	0.0176	0.0908
	(0.0551)	(0.0639)	(0.0544)	(0.0639)
White	-0.0290	0.00527	-0.0452	0.0137
	(0.0313)	(0.0405)	(0.0309)	(0.0406)
Hispanic	0.0280	0.0580*	0.00146	0.0649**
	(0.0256)	(0.0331)	(0.0256)	(0.0331)
Year2012	-0.129***	-0.363***	-0.157***	-0.350***
	(0.0157)	(0.0194)	(0.0156)	(0.0195)
Constant	0.540***	0.617***	0.573***	0.596***
	(0.0617)	(0.0755)	(0.0613)	(0.0756)
Observations	2,288	2,288	2,288	2,288
R-squared	0.307	0.205	0.338	0.197
Robust standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				
Ommited Reference Variables: Age >25, Household Size of 1, Some College, Manhattan, Soup Kitchen				

Appendix B

Table 10: 2007 Data with Variable Threshold Analysis				
	Food Stamp Eligible	Poverty Eligible	Food Stamp Eligible	Poverty Eligible
	2007 Threshold	2007 Threshold	2012 Threshold	2012 Threshold
	2007 Data	2007 Data	2007 Data	2007 Data
Female	0.00808	0.0120	0.00923	0.0120
	(0.0207)	(0.0226)	(0.0207)	(0.0226)
Retired	0.0522	0.0488	0.0561	0.0488
	(0.0384)	(0.0399)	(0.0384)	(0.0399)
Disabled	-0.000836	-0.00734	-0.000231	-0.00734
	(0.0215)	(0.0237)	(0.0215)	(0.0237)
Rent	0.0353	0.00698	0.0329	0.00698
	(0.0825)	(0.0850)	(0.0825)	(0.0850)
Homeless	0.0555	0.0257	0.0540	0.0257
	(0.0841)	(0.0870)	(0.0842)	(0.0870)
Age 25-35	-0.00167	0.000361	-0.00102	0.000361
	(0.0803)	(0.0812)	(0.0801)	(0.0812)
Age 35-45	-0.0231	-0.0331	-0.0222	-0.0331
	(0.0750)	(0.0765)	(0.0748)	(0.0765)
Age 45-55	0.00497	-0.00647	0.00598	-0.00647
	(0.0746)	(0.0757)	(0.0744)	(0.0757)
Age 55-65	-0.0475	-0.0591	-0.0477	-0.0591
	(0.0774)	(0.0788)	(0.0772)	(0.0788)
Age > 65	-0.139*	-0.145*	-0.136*	-0.145*
	(0.0823)	(0.0839)	(0.0821)	(0.0839)
Food Stamp Participation	0.248***	0.217***	0.248***	0.217***
	(0.0188)	(0.0207)	(0.0187)	(0.0207)
Household Size 2, 3 & 4	-0.0759***	-0.0582**	-0.0737***	-0.0582**
	(0.0239)	(0.0251)	(0.0239)	(0.0251)
Household Size 5 & 6	-0.0584	-0.0354	-0.0579	-0.0354
	(0.0386)	(0.0396)	(0.0386)	(0.0396)
Household Size <7	-0.0365	-0.0434	-0.0367	-0.0434
	(0.0391)	(0.0461)	(0.0391)	(0.0461)
Less than 12th grade	0.0131	0.0144	0.00917	0.0144
	(0.0256)	(0.0272)	(0.0256)	(0.0272)
High School Degree Equivalent	0.0233	0.0265	0.0205	0.0265
	(0.0474)	(0.0514)	(0.0472)	(0.0514)
Graduated from High School	0.0351	0.0320	0.0312	0.0320
	(0.0298)	(0.0318)	(0.0297)	(0.0318)
Bronx	0.0444	0.0528	0.0446	0.0528
	(0.0290)	(0.0323)	(0.0289)	(0.0323)
Brooklyn	0.0242	0.0335	0.0241	0.0335
	(0.0269)	(0.0294)	(0.0269)	(0.0294)
Queens	-0.0237	-0.0133	-0.0210	-0.0133
	(0.0324)	(0.0341)	(0.0324)	(0.0341)
Staten Island	0.0714**	0.0852**	0.0715**	0.0852**
	(0.0357)	(0.0398)	(0.0357)	(0.0398)
Food Pantry	0.0188	0.0257	0.0190	0.0257
	(0.0230)	(0.0245)	(0.0230)	(0.0245)
Black	0.0175	0.0354	0.0116	0.0354
	(0.0325)	(0.0358)	(0.0324)	(0.0358)
Asian	0.152**	0.136*	0.146**	0.136*
	(0.0595)	(0.0702)	(0.0593)	(0.0702)
White	-0.0469	-0.0531	-0.0535	-0.0531
	(0.0474)	(0.0522)	(0.0473)	(0.0522)
Hispanic	0.0332	0.0552	0.0280	0.0552
	(0.0347)	(0.0383)	(0.0347)	(0.0383)
Constant	0.707***	0.708***	0.714***	0.708***
	(0.114)	(0.117)	(0.113)	(0.117)
Observations	1,124	1,124	1,124	1,124
R-squared	0.181	0.135	0.178	0.135
Robust standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				
Ommited Reference Variables: Age >25, Household Size of 1, Some College, Manhattan, Soup Kitchen				

Appendix C

Table 11: 2012 Data with Variable Threshold Analysis				
	Food Stamp Eligible	Poverty Eligible	Food Stamp Eligible	Poverty Eligible
	2007 Threshold	2007 Threshold	2012 Threshold	2012 Threshold
	2012 Data	2012 Data	2012 Data	2012 Data
Female	-0.00765	0.00674	-0.0155	0.0156
	(0.0204)	(0.0306)	(0.0201)	(0.0306)
Retired	-0.0930***	-0.110**	-0.0540	-0.101**
	(0.0344)	(0.0480)	(0.0342)	(0.0480)
Disabled	0.0248	0.0881**	0.0210	0.0853**
	(0.0210)	(0.0377)	(0.0206)	(0.0375)
Rent	0.0597*	0.0718	0.0428	0.0794*
	(0.0347)	(0.0449)	(0.0342)	(0.0451)
Homeless	0.0545	0.0984*	0.0490	0.107*
	(0.0414)	(0.0579)	(0.0410)	(0.0580)
Age 25-35	0.0369	-0.0153	0.0183	-0.00747
	(0.0590)	(0.0903)	(0.0587)	(0.0905)
Age 35-45	0.0118	-0.0349	-0.00898	-0.0267
	(0.0562)	(0.0842)	(0.0563)	(0.0843)
Age 45-55	0.0385	0.0127	0.00156	0.0286
	(0.0540)	(0.0804)	(0.0542)	(0.0804)
Age 55-65	0.0266	-0.0232	0.0190	-0.0159
	(0.0563)	(0.0821)	(0.0567)	(0.0820)
Age > 65	0.119**	0.0908	0.0836	0.0996
	(0.0596)	(0.0865)	(0.0601)	(0.0865)
Food Stamp Participation	0.558***	0.148***	0.620***	0.147***
	(0.0232)	(0.0311)	(0.0227)	(0.0312)
Household Size 2, 3 & 4	-0.00532	-0.0183	-0.0395*	-0.0179
	(0.0230)	(0.0351)	(0.0228)	(0.0351)
Household Size 5 & 6	0.00230	0.0217	-0.0104	0.0377
	(0.0360)	(0.0502)	(0.0357)	(0.0503)
Household Size <7	-0.0378	-0.0228	-0.00425	-0.0124
	(0.0463)	(0.0716)	(0.0482)	(0.0711)
Less than 12th grade	0.0532**	0.0760**	0.0574**	0.0781**
	(0.0244)	(0.0363)	(0.0238)	(0.0363)
High School Degree Equivalent	0.0641**	-0.00711	0.0572*	-0.00485
	(0.0304)	(0.0478)	(0.0295)	(0.0477)
Graduated from High School	0.0842***	0.0369	0.0607**	0.0436
	(0.0282)	(0.0410)	(0.0277)	(0.0410)
Bronx	0.0521*	0.148***	0.0513*	0.152***
	(0.0295)	(0.0489)	(0.0292)	(0.0487)
Brooklyn	0.0528*	0.0709	0.0351	0.0740
	(0.0280)	(0.0453)	(0.0272)	(0.0453)
Queens	0.0356	0.0795*	0.0316	0.0724
	(0.0302)	(0.0463)	(0.0292)	(0.0464)
Staten Island	-0.0519	-0.0619	-0.0364	-0.0758
	(0.0409)	(0.0655)	(0.0392)	(0.0656)
Food Pantry	-0.0308	-0.0568	-0.0312	-0.0553
	(0.0244)	(0.0377)	(0.0240)	(0.0377)
Black	0.0250	0.0899*	0.0111	0.0926*
	(0.0329)	(0.0525)	(0.0328)	(0.0523)
Asian	0.0134	0.0512	-0.0791	0.0809
	(0.0804)	(0.103)	(0.0741)	(0.104)
White	0.00981	0.0637	-0.0167	0.0796
	(0.0405)	(0.0622)	(0.0395)	(0.0621)
Hispanic	0.0660*	0.0853	0.0166	0.0999*
	(0.0349)	(0.0559)	(0.0348)	(0.0556)
Constant	0.270***	0.184*	0.300***	0.162
	(0.0727)	(0.105)	(0.0721)	(0.104)
Observations	1,164	1,164	1,164	1,164
R-squared	0.452	0.074	0.507	0.075
Robust standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				
Ommited Reference Variables: Age >25, Household Size of 1, Some College, Manhattan, Soup Kitchen				