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The impact of the 2008 economic recession on the food security level of veterans relative to non-veterans

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ABSTRACT

Objective: By examining nationally representative data, this paper aims to determine the impact of the 2008 financial crisis on the food security level of veterans relative to non-veterans.

Design: Data from the 2006-2009 waves of the Current Population Survey Food Security Supplement (CPS-FSS) were utilized. Given the nature of food security, serving as a dependent variable in this study, an ordinal logistic regression is implemented. The aforesaid model will be complemented by a difference-in-differences (DID) estimation technique comparing veterans and non-veterans.

Setting: Nationally representative data from the 2006-2009 waves of the Current Population Survey – Food Security Supplement.

Results: While being a veteran significantly lowers food security during the 2006 to 2009 period, the difference in differences estimator comparing veterans and non-veterans provides insignificant results. This means that although the 2008 economic recession was a difficult period for the American economy, it did not have a major impact on the food security level of veterans relative to non-veterans.

Conclusions: Having concentrated on younger veterans, this study reveals that members of this group are prone to experience food insecurity and should be the target of more effective assistance programs.

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I. INTRODUCTION

Since time immemorial, food security has played a pivotal role in the economic development of civilization. Its presence can be felt in every facet of human endeavor. Food security, as defined by the United Nations' Committee on World Food Security, "is the condition in which 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."[1] A stable economic atmosphere is an essential prerequisite for attaining food security. Recent events have served to confirm this view. According to Swagel (2010);

> U.S. households lost on average nearly $5,800 in income due to reduced economic growth during the acute stage of the financial crisis from September 2008 through the end of 2009. Costs to the federal government due to its interventions to mitigate the financial crisis amounted to $2,050, on average, for each U.S. household. Moreover, 5.5 million jobs were lost during the financial crisis. (p.16)

Swagel (2010) demonstrates the far reaching effects of the economic recession of 2008. These effects are further exemplified in graph 1 (please refer to appendix section). On the graph, one can observe a drastic increase in food insecurity during the financial recession. Based on this evidence, a connection between economic instability, in the form of income loss, and food insecurity is established.

The recent economic crisis cast an ominous shadow over a considerable number of Americans. According to the Department of Veteran Affairs (VA), there are approximately 22

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[1] The Committee on World Food Security (CFS) was established in 1974 as an intergovernmental body to serve as a forum in the United Nations System for review and follow-up of policies concerning world food security including production and economic access to food.

million[2] military veterans in the United States. A veteran is "a person who served in the active military, naval, or air service and who was discharged or released under conditions other than dishonorable"[3]. A veteran in the United States is entitled to benefits unavailable to the general population. Ranging from tuition assistance and vocational rehabilitation to VA pensions and low-interest loans, these benefits are numerous. Furthermore, there is a wide variety of both public and private assistance programs accessible to veterans in need. Consequently, conducting food security research on our veteran population gives us the opportunity to determine the effectiveness of these benefits and programs while at the same time gather valuable information on the socio-economic status and demographic characteristics of a relatively large sample of this nation's inhabitants. Therein lies the significance of this thesis.

II. LITERATURE REVIEW

Several studies have been conducted that measure food security in the veteran population. Miller et al. (2015) compare rates of food insecurity among households with veterans of the U.S. Armed Forces and non-veteran households. Data from the 2005-2013 waves of the Current Population Survey - Food Security Supplement were utilized to identify rates of food insecurity. By estimating the odds and probability of food insecurity in veteran and non-veteran households, the authors found that uncontrolled models show a much lower rate of food insecurity (8.4 %) in veteran households than in non-veteran households (14.4%). For households with veterans who served from 1990 to 2001 and from 1975 to 1990 however, food insecurity was significantly

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[2] Risen, T. (2014, November 10). *Veterans Day Data Boot Camp*. Retrieved from
 https://www.usnews.com/news/blogs/data-mine/2014/11/10/veterans-day-data-boot-camp
[3] Title 38 of the Code of Federal Regulations.

higher, 14.8 % and 14.1 % respectively. These results indicate a considerable change in food

insecurity between older veterans who served in the Vietnam War or prior and recent veterans

from 1975 onwards. A supplemental controlled analysis found that the odds of food insecurity

were significantly higher (OR[4]=1.099, P[5]= 0.0006) among recent veterans and significantly

lower (OR=0.914, P = 0.0025) among older veterans compared with non-veteran homes. In their

article, Miller et al. (2015) reveal that recent veterans may be at higher risk for food insecurity

and should be the target of more efficient social policies designed to foster their nutritional well

being.

Further contributing to the study of food security, Widome et al. (2014) examine food

insecurity among U.S. veterans who have served in Iraq and Afghanistan since 2001. This article

uses data from the Department of Veteran Affairs' (Operation Enduring Freedom/Operation Iraqi

Freedom/Operation New Dawn) roster. The latter identifies all veterans who have served in the

US wars in Iraq and Afghanistan since October 2001. In addition, randomly sampled information

from 800 female and 1200 male veterans who had at least one out-patient health-care visit in the

Minneapolis VA Healthcare System was gathered. At the time of this survey (summer 2012),

70.8 % of the current addresses on file were within the state of Minnesota and the rest were

outside the state. The survey response rate was 52.3 %, which, according to the authors of this

article, exceeds the response rate of nearly all other population based survey research on Iraq and

Afghanistan war veterans. Data from the VA's electronic medical record were used to

supplement information collected from the abovementioned survey. Lastly, food security was

ascertained using the US Household Food Security Module: Six Item Short Form. This module

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[4] Odds ratio
[5] Probability

measures food security over the prior 12 months and has been shown to be a valid identifier of households that have low and very low food security. Upon close analysis of this data, it was revealed that over one in four veterans reported past-year food insecurity with 12 % reporting very low food security. Food-insecure veterans, according to the authors of this article, tend to be younger, not married/partnered, live in households with more children, earn lower incomes, have a lower final military pay grade, are more likely to use tobacco, report more frequent binge drinking, and sleep less, compared with those who are food secure.

Brostow et al. (2017) examine the prevalence of food insecurity in an older population of U.S. military veterans. To do so, data from the 2012 wave of the Health and Retirement Study and the 2013 Health Care and Nutrition Mail Survey of 2560 male participants (1254 veterans) were used to estimate the occurrence of food insecurity among male veterans. The results of this study unveil that among male veterans, 6.4% reported food insecurity, compared to 11.9% of male non-veterans. Younger age, difficulty with daily activities and depression were significantly associated with increased odds of food insecurity among male veterans aged 50 to 64. In male veterans age 65 years and older, current smoking and depression were significantly associated with increased odds of food insecurity. While failing to include younger veterans and females in its analysis, the conclusions of this research share one crucial similarity to those of Miller et al. (2015) and Widome et al. (2014); the probability of food insecurity for military veterans tends to decrease with age.

As stated in the introduction section of this thesis, food security is an essential element of the American economic apparatus. While prior research in this area has revealed important information, the recent economic recession endured by the United States has been a neglected topic in food security literature. With this thought in mind, this paper will be the first to study the

impact of the 2008 economic recession on the food security level of veterans relative to non-veterans.

III. DATA

Data from the 2006-2009 waves of the Current Population Survey Food Security Supplement (CPS-FSS) were utilized. This supplement is administered once a year and serves as an addition to the December Current Population Survey (CPS). Obtained from the US Department of Agriculture (USDA), this survey is of significant importance as it gives researchers nation-wide estimates on food security. Gathering data at the household level, the (CPS) requests participants to provide information on socio-economic factors such as; labor force participation, household demographics, and previous or current military service. The CPS-FSS enhances the informative value of the CPS by including questions about adult food security status, participation in food assistance programs, and other household topics involving food security. Comprising four years of data, the final sample being analyzed in this thesis consists of 43,386 households of which 1,356 are veteran households. Lastly, since the data used in this paper provide no means to associate information to individual participants, this study cannot be regarded as human subject research and therefore does not require approval by an ethical review board.

IV. METHODOLOGY

The CPS-FSS contains a number of questions pertaining to food security. The question on which this study is based requests survey participants to provide the adult food security status of their household. Adult food security is coded as follows; -9 denotes "no response" (comprising 107 households, this value was deleted from the research sample), -1 indicates "not in universe", the 7,726 households in this category make up two groups, the first group consisting of 2,705

households is part of the food security supplement interview and is considered by the USDA, the designers of this survey, to be food secured. Subsequently, this group is recoded as 1. The second group in this category, made up of 5,021 households, is not part of the food supplement interview and is therefore dropped from the general sample. 1 denotes "high food security among adults", 2 indicates "marginal food security among adults", 3 stands for "low food security among adults", and lastly, 4 denotes "very low food security among adults". Given the nature of food security, serving as a dependent variable in this study, an ordered logistic regression will be implemented. Other than being more frequently used, the aforesaid model has one important advantage over ordered probit; it generates coefficients, through exponentiation, that take an odds ratio form, thus making them easier to interpret. The following is a more in depth explanation of this model; "an ordinal logistic regression is a statistical analysis method that can be used to model the relationship between an ordinal response variable and one or more explanatory variables. An ordinal variable is a categorical variable for which there is a clear ordering of the category levels. The explanatory variables may be either continuous or categorical"[6]. A difference-in-differences (DID) approximation technique will be used to complement the abovementioned ordinal logistic model. The difference in differences (DID) technique estimates treatment effects by comparing the pre and post-treatment differences in the outcome of a treatment group and a control group. For the purpose of this study, veterans are the treatment group and non-veterans make up the control group. Period 2006-2007 comprises the pre-treatment years while period 2008-2009 represents the post-treatment years.

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[6] Stephen Parry, "Ordinal Logistic Regression Models and Statistical Software: What You Need to Know," *Cornell University Statistical Consulting Unit*. June 2016, https://www.cscu.cornell.edu/news/statnews/stnews9.pdf. (Accessed October 13 2017).

The objective of this thesis is to examine the impact of the 2008 financial crisis on the food security level of veterans relative to non-veterans after taking into account other factors that might otherwise be responsible for any differences in food security levels. These factors are represented by the following variables; family income, metropolitan area size, age[7], age squared, marital status, gender, education (since individuals need at least a high school degree to join the military, all values indicating a level of education less than high school have been deleted), race (Whites, Blacks, Asians), disability, Hispanic, and number of children. Through the use of these variables and the previously mentioned statistical methods, the main objective of this thesis will be achieved.

V. RESULTS

After focusing on the data and methodology used in this study, the results of this thesis will now be disclosed. It is important however, to first indicate that the summary statistics and regression tables utilized in this paper can be found in the appendix section. That being said, this section will begin with a brief description of summary statistics. Due to the substantial amount of data in table 2, the focal points of the aforesaid description will be ordered categories with the greatest full sample percentages followed by categories with the lowest "sensible" full sample representation percentages.

Approximately 25.46% of the 43,386 households making up the data are located in non-metropolitan areas; 31.49% of veteran households live in these areas compared 25.26% of non-veteran households. In contrast, only 9.21% of households in the general sample live in areas

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[7] This paper focuses on "young" military veterans in order to mitigate the effects of rank-based veteran privileges such as military retirement benefits. These benefits can affect the food security of a veteran. Furthermore, age has been coded so as to include the same individuals throughout the 2006-2009 timeframe. The age group for the year 2006 is 21 to 30. For the year 2007 the age group is 22 to 31. For the year 2008 the age group is 23 to 32. The age group for the year 2009 is 24 to 33.

with 100,000 to 249,999 inhabitants. In these regions, only 11.06% of veterans and 9.15% of non-veterans reside. The $75,000 to $99,999 family income range presents us with more interesting data. In it, we find 13.05% households from the full sample, followed by 12.83% of the veteran households studied. At 13.05%, a non-veteran presence is greater here. The prevalence of these population groups subsides in the $7,500 to $9,999 family income range. Here we find only 1.41% of the total sample, 1.11% of veterans, and 1.42% of non-veterans. As far as marital status is concerned, 52.01% of individuals from the full sample have never been married. In this category, the numbers for veterans and non-veterans are 36.80% and 52.50% respectively. In comparison, only 1.12% of individuals in the sample fall in the "married-spouse absent" group, including 0.96% of veterans and 1.12% of non-veterans

Next we come across the racial distribution of data. Here, Whites enjoy substantially higher representation; 84.78% for the entire sample, 85.91% for veterans, and 84.74% for non-veterans. Asians have the lowest representative percentages; 5.47% for the whole sample, 2.43% for veterans, and 5.57% for non-veterans. A high proportion of households experience high food security among adults; 77.65% in the full sample, 73.30% for veterans, and 77.79% for non-veterans. Very low food security among adults is distributed as follows; 4.52% for the complete sample, 6.19% for veterans, and 4.47% for non-veterans. As far as education is concerned, a significant number of individuals have graduated from high school or have been awarded a GED diploma. These individuals make up 29.77% of the general sample, of these 33.55% are veterans and 29.65% are non-veterans. Once we come to the professional school degree category, the percentages are much lower; 1.09% for the total sample, 0.37% for veterans and 1.11% for non-veterans. For "number of children", a noticeable number of individuals have none; 64.19% for the entire population sample followed by 58.19% of veterans and 64.38% of non-veterans. In

comparison, only 1.33% of the whole sample, 1.25% of veterans, and 1.33% of non-veterans have 4 children.

Lastly, for the variables age, age squared, gender, disability, and Hispanic, table 2 provides the mean followed by the standard deviation in parenthesis. The mean for age in the general sample is 26.99, followed by 27.60 for veterans and 26.97 for non-veterans. The mean for gender is 0.48 in the sample, 0.79 for veterans, and 0.47 for non-veterans. There's few instances of disability in the sample; a .008 mean for the complete sample, .011 for veterans, and .008 for non-veterans. For the variable Hispanic; the full sample, veterans, and non-veterans have the means; 0.12, 0.08, and 0.12 respectively.

Before I proceed with the results obtained from an ordinal logistic regression, it is important to emphasize that due to the manner in which food security is coded (for further details please refer to pages 8 and 9 of the methodology section); a positive coefficient lowers food security while a negative coefficient improves food security. Having said that, results indicate that being a veteran (this group makes up approximately 3.13% of the data being analyzed) lowers the log odds of being in a higher food security level by 0.271 with a z-statistic of 2.76. The latter being significant at the $p < 0.01$ level (assuming other conditions remain the same[8]). The variable "recession", comprising pre and post treatment years, decreases the log odds of being in a better food security level by 0.571 with a highly significant z-value of 21.35. The coefficient for the difference in differences estimator is -0.0957. This means that for veterans, the 2008 economic regression caused a small increase in the log odds of being in a higher food security level. The previous result however is insignificant; its z statistic is only -0.74.

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[8] This assumption applies to all subsequent ordinal logistic regression coefficients.

Further analysis of the socio-economic composition of this data reveals valuable supplementary information. For each additional child in a household, the log odds of having better food security decrease by 0.199 with a significant z-value of 14.81. Race also plays an important role in determining food security. Since "White" is the omitted value in the "race" variable, only results for the food security of Blacks, Asians, and Hispanics will be provided. The coefficients for these groups are; .259, -0.244, and .273 respectively. The following are the corresponding z statistics for these coefficients; 6.75, -3.67, and 7.64. The significance of these z statistics reaches the $p < 0.001$ level. Being black or Hispanic lowers the log odds of having greater food security by .259 and .273. Being Asian improves food security by -0.244.

Education plays a major role in acquiring food security. In this study, "high school education" is the omitted value in the "education" variable; therefore this analysis will begin by focusing on those individuals who have at least attended college but did not graduate. Coefficients for education are provided in the following order; some college (-0.225), associate degree – vocational (-0.271), associate degree – academic (-0.397), bachelor's degree (-0.997), master's degree (-1.192), professional degree (-1.387), and doctoral degree (-1.439). All coefficients for education are significant at the $p < 0.001$ level. This means that education at every level increases the log odds of being in a better food security category. The magnitude of this increase is subject to the coefficient value experienced at each educational level.

Marital status also plays an important part in the food security level enjoyed by an individual. The value for "married – spouse present" is omitted in this regression. Married – spouse absent, widowed, divorced, separated, and never married, have the following coefficients; 0.0978, 0.171, 0.281, 0.301, and 0.109. Consequently, all values for marital status decrease the

log odds of being in a better food security category. The categories "divorced", "separated" and "never married" are significant at the $p < 0.001$ level. All other values are insignificant.

Being the cornerstone of a household's economic stability, family income has, in this study, a coefficient value of -0.184 with a highly significant z statistic at the $p < 0.001$ level (-53.80). A one unit increase in family income, improves the log odds of enjoying greater food security by -0.184. Although minute, metropolitan area size has the opposite effect on food security. Its coefficient is only 0.00693 with an insignificant z-value of 1.33.

Age and disability decrease the log odds of reaching a higher level of food security by 0.143 and 0.238. The corresponding z statistics for these coefficients are; 2.10 and 2.20, both values are significant at the $p < 0.05$ level. "Age squared" however, has the opposite effect on food security. Its coefficient is -0.00250 with a significant z value, at the $p < 0.05$ level, of -1.98. Lastly, gender increases the log odds of having greater food security by -0.104 with a z statistic of -4.02 (significant at the $p < 0.001$ level).

VI. ANALYSIS

The aim of this thesis is to determine the impact of the 2008 financial crisis on the food security level of veterans relative to non-veterans. Results from this research suggest that being a veteran significantly lowers food security during the 2006 to 2009 period. In addition, the variable "recession", comprising pre and post treatment years, has a significant negative effect on food security. The difference in differences estimator comparing veterans and non-veterans however, provides insignificant results. This means that while the 2008 economic recession was a difficult period for the American economy, it did not have a differential impact on the food

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security level of veterans relative to non-veterans. In light of this evidence, the objective of this paper has been accomplished.

Having determined the impact of the 2008 economic recession on the food security level of veterans, the results obtained in this thesis will be compared to those provided in the literature review section. Miller et al. (2015) compare rates of food insecurity among households with veterans of the U.S. Armed Forces and non-veteran households. Data from the 2005-2013 waves of the Current Population Survey - Food Security Supplement were utilized to identify rates of food insecurity. After extensive analysis, results indicate a considerable change in food insecurity between older veterans who served in the Vietnam War or prior and recent veterans from 1975 onwards. This article concludes that recent veterans may be at higher risk for food insecurity and should be the target of more efficient social policies designed to foster their dietary well being. As previously indicated, the population identified as "recent veterans" in the study performed by Miller et al. (2015) belongs to a period from 1975 to 2013. Although this is a far greater time frame than the one researched in this thesis (2006-2009), the results of these two studies reveal similar information; for younger veterans, it is more difficult to gain access to a sufficient quantity of affordable and nutritious food.

Widome et al. (2014) examine food insecurity among U.S. veterans who have served in Iraq and Afghanistan since 2001. In this article, the Department of Veteran Affairs' (Operation Enduring Freedom/Operation Iraqi Freedom/Operation New Dawn) roster was used. Upon close analysis of this data, it is revealed that food-insecure veterans tend to be younger, not married/partnered, live in households with more children, and earn lower incomes than those who are food secure. This thesis confirms the results obtained by Widome et al. (2014) by identifying younger veterans as more vulnerable to experiencing food insecurity. While

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information obtained in this thesis suggests younger veterans[9] have on average, a greater number of children than non-veterans[10] from the same age group, veterans appear to have on average, slightly higher family income. The latter contradicts the results obtained by Widome et al. (2014).

Brostow et al. (2017) examine the prevalence of food insecurity in an older population of U.S. military veterans. To do so, data from the 2012 wave of the Health and Retirement Study and the 2013 Health Care and Nutrition Mail Survey were used. Results from this study reveal that among male veterans, 6.4% reported food insecurity, compared to 11.9% of male non-veterans. Younger age, difficulty with daily activities, and depression are significantly associated with increased odds of food insecurity among male veterans aged 50 to 64. While the age group studied in this article is much older than the sample being researched in this thesis, it does reiterate the notion that "younger" veterans are at greater risk of food insecurity.

In order to better understand the food security needs of our veteran population, further research must be conducted in seldom covered areas, such as; duration of service, number of deployments, combat duty exposure, rank, and branch of service. Moreover, the food security supplement survey is conducted at the household level; since CPS does not include information on homeless veterans, the data utilized in this research does not account for the entire US veteran population. Lastly, we must also take into consideration the possibility that there could be individuals who qualify for food assistance but refuse to enroll due to the social stigma associated with using these programs. As the most developed nation in the world, the United States has a moral responsibility to ensure that those individuals who have sacrificed so much for

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[9] Mean annual family income of 10.809 for veterans or approximately $35,000 to $39,999. Mean number of children of .732.
[10] Mean annual family income of 10.798 for non-veterans or approximately $35,000 to $39,999. Mean number of children of .642.

this country enjoy food security. More active research on this field is only the first step toward achieving this goal.

VII. CONCLUSION

Succinctly, using a nationally representative sample of American households, this thesis was able determine the impact of the 2008 economic recession on the food security level of veterans relative to non-veterans. A significant strength associated with this paper is the use of comprehensive demographic data to determine variations between veteran and non-veteran households. While the aforesaid financial crisis was a difficult period for the American economy, it did not have a significant effect on the food security of veterans vis-à-vis non-veterans. Having concentrated on younger veterans, this study reveals that members of this group are more likely to experience food insecurity.

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Graph 1.

Trends in prevalence rates of food insecurity and very low food security in U.S. households, 1995-2016

Percent of households
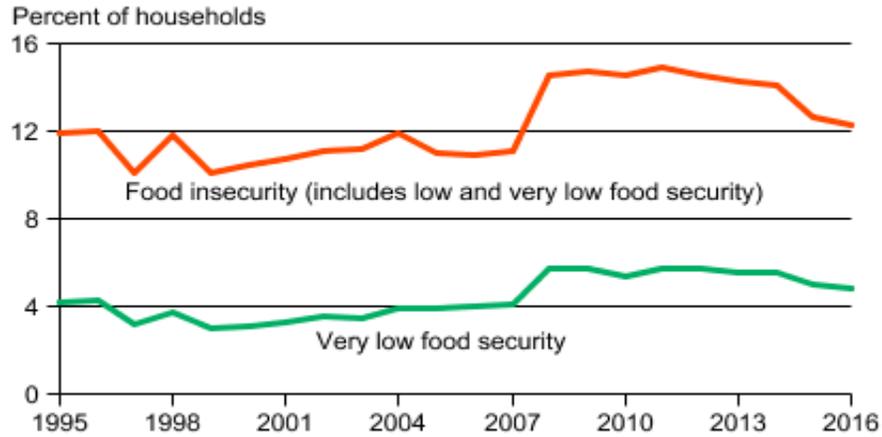
Note: Prevalence rates for 1996 and 1997 were adjusted for the estimated effects of differences in data collection screening protocols used in those years.

Source: US Department of Agriculture. (2017). Trends in prevalence rates of food insecurity and very low food security in U.S. households, 1995-2016 [Graph]. *USDA, Economic Research Service.* Retrieved from https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/key-statistics-graphics.aspx

Table 1. Summary Statistics

	Full sample	Veteran	Non-veteran
Metropolitan Population Size			
Non-metropolitan	25.46%	31.49%	25.26%
	(11,044)	(427)	(10,617)
100,000 - 249,999	9.21%	11.06%	9.15%
	(3,994)	(150)	(3,844)
250,000 - 499,999	9.38%	10.10%	9.36%
	(4,069)	(137)	(3,932)
500,000 - 999,999	9.72%	9.14%	9.74%
	(4,216)	(124)	(4,092)
1,000,000 - 2,499,999	16.26%	18.44%	16.19%
	(7,056)	(250)	(6,806)
2,500,000 - 4,999,999	16.82%	13.35%	16.93%
	(7,297)	(181)	(7,116)
5,000,000+	13.16%	6.42%	13.38%
	(5,710)	(87)	(5,623)
Family Income			
Less than $5,000	2.45%	1.25%	2.49%
	(1,063)	(17)	(1,046)
5,000 to 7,499	1.72%	1.18%	1.74%
	(747)	(16)	(731)
7,500 to 9,999	1.41%	1.11%	1.42%
	(612)	(15)	(597)
10,000 to 12,499	2.12%	2.51%	2.10%
	(918)	(34)	(884)
12,500 to 14,999	2.24%	1.84%	2.25%
	(970)	(25)	(945)
15,000 to 19,999	3.96%	3.17%	3.99%

	(1,719)	(43)	(1,676)
20,000 to 24,999	5.28%	5.09%	5.29%
	(2,291)	(69)	(2,222)
25,000 to 29,999	6.18%	7.67%	6.14%
	(2,683)	(104)	(2,579)
30,000 to 34,999	6.98%	9.07%	6.91%
	(3,028)	(123)	(2,905)
35,000 to 39,999	6.44%	7.37%	6.41%
	(2,795)	(100)	(2,695)
40,000 to 49,999	10.51%	10.32%	10.52%
	(4,561)	(140)	(4,421)
50,000 to 59,999	10.29%	9.73%	10.31%
	(4,465)	(132)	(4,333)
60,000 to 74,999	12.37%	15.93%	12.26%
	(5,369)	(216)	(5,153)
75,000 to 99,999	13.05%	12.83%	13.05%
	(5,661)	(174)	(5,487)
100,000 to 149,999	9.83%	8.33%	9.88%
	(4,267)	(113)	(4,154)
150,000 or more	5.16%	2.58%	5.24%
	(2,237)	(35)	(2,202)

Marital Status

Married - Spouse Present	41.33%	49.71%	41.06%
	(17,931)	(674)	(17,257)
Married - Spouse Absent	1.12%	0.96%	1.12%
	(485)	(13)	(472)
Widowed	0.15%	0.00%	0.15%
	(64)	(0)	(64)
Divorced	3.80%	9.73%	3.61%
	(1,649)	(132)	(1,517)

Separated	1.60% (694)	2.80% (38)	1.56% (656)
Never Married	52.01% (22,563)	36.80% (499)	52.50% (22,064)
Race			
White	84.78% (36,782)	85.91% (1,165)	84.74% (35,617)
Black	9.75% (4,229)	11.65% (158)	9.69% (4,071)
Asian	5.47% (2,375)	2.43% (33)	5.57% (2,342)
Food security			
High Food Security among Adults	77.65% (33,689)	73.30% (994)	77.79% (32,695)
Marginal Food Security among Adults	10.57% (4,585)	12.32% (167)	10.51% (4,418)
Low Food Security among Adults	7.26% (3,149)	8.19% (111)	7.23% (3,038)
Very Low Food Security among Adults	4.52% (1,963)	6.19% (84)	4.47% (1,879)
Education			
High School Grad-Diploma or Equiv (GED)	29.77% (12,917)	33.55% (455)	29.65% (12,462)
Some College but No Degree	24.55% (10,650)	39.45% (535)	24.07% (10,115)
Associate Degree- Occupational/Vocation	5.29% (2,297)	5.90% (80)	5.27% (2,217)
Associate Degree-Academic Program	5.62%	4.94%	5.64%

	(2,439)	(67)	(2,372)
Bachelor's Degree (Ex: BA, AB, BS)	26.75% (11,605)	12.91% (175)	27.19% (11,430)
Master's Degree (Ex: MA, MS, MENG, MED)	6.28% (2,726)	2.73% (37)	6.40% (2,689)
Professional School Deg (Ex: MD, DDS)	1.09% (473)	0.37% (5)	1.11% (468)
Doctorate Degree (Ex: PhD, EDD)	0.64% (279)	0.15% (2)	0.66% (277)
Number of Children			
0	64.19% (27,849)	58.19% (789)	64.38% (27,060)
1	15.91% (6,903)	18.95% (257)	15.81% (6,646)
2	13.30% (5,770)	16.30% (221)	13.20% (5,549)
3	4.91% (2,129)	5.09% (69)	4.90% (2,060)
4	1.33% (577)	1.25% (17)	1.33% (560)
5	0.26% (113)	0.00% (0)	0.27% (113)
6	0.09% (37)	0.22% (3)	0.08% (34)
7	0.02% (7)	0.00% (0)	0.02% (7)
8	0.00% (1)	0.00% (0)	0.00% (1)
Age	26.99* (3.065)	27.60* (2.812)	26.97* (3.071)

Age Squared	737.75*	769.84*	736.71*
	(165.752)	(154.582)	(165.998)
Gender	.48*	.79*	.47*
	(.499)	(.409)	(.499)
Disability	.008*	.011*	.008*
	(.091)	(.105)	(.090)
Hispanic	.12*	.08*	.12*
	(.324)	(.267)	(.325)
N	43,386	1,356	42,030

% percentage value, frequency in parenthesis
*mean coefficients, standard deviation in parentheses

Table 2. Ordinal Logistic Regression Data

	Food Security
Veteran	0.271** (2.76)
Recession	0.571*** (21.35)
Veteran (x) recession (Difference-in-difference estimator)	-0.0957 (-0.74)
Number of children	0.199*** (14.81)
Race - Black	0.259*** (6.75)
Race - Asian	-0.244*** (-3.67)
Educ. – Some College	-0.225*** (-7.43)
Educ. – Associate Degree - Vocational	-0.271*** (-4.91)
Educ. – Associate Degree - Academic	-0.397*** (-7.16)
Educ. – Bachelor's Degree	-0.997*** (-26.09)
Educ. – Master's Degree	-1.192*** (-15.73)
Educ. – Professional Degree	-1.387*** (-7.30)
Educ. – Doctorate Degree	-1.439*** (-5.44)
Disability	0.238* (2.20)
Gender	-0.104*** (-4.02)
Marital status - Married – Spouse absent	0.0978 (0.90)
Marital status - Widowed	0.171 (0.60)
Marital status - Divorced	0.281*** (4.75)
Marital status - Separated	0.301*** (3.55)
Marital status – Never married	0.109*** (3.44)
Age	0.143* (2.10)

Age Squared	-0.00250[*] (-1.98)
Family Income	-0.184[***] (-53.80)
Metropolitan Area Size	0.00693 (1.33)
Hispanic	0.273[***] (7.64)
N	43386

(x) denotes multiplication
z statistics in parentheses
[*] $p < 0.05$, [**] $p < 0.01$, [***] $p < 0.001$