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The Interaction between the Supplemental Nutrition Assistance Program and Private Charities to Enhance Food Security in Low Income Families

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Introduction and Background

- The Supplemental Nutrition Assistance Program (SNAP), formally called the food stamp program, is the largest anti-hunger program in the nation, which has assisted about 40 million low-income Americans in 2017 to afford an adequate diet.
- Private food charities are nonprofit, community-based organizations that provide relief for the hungry.
- It was estimated that private food charities provide assistance to 46 million people including 14 million children, www.feedingamerica.org(2017).

Introduction and Background

- There has been a lot of research on SNAP but little has been done to analyze the relationship between the private and the public food programs as they relate to food security.
- The aim of this paper is to analyze the importance of factors affecting low-income household to participate in the SNAP program as well as the private food charities, and how these two programs have worked to enhance food security among low income households.

Literature Review

Studies on the relationship between SNAP and food security on low income households

- Use of cross-sectional and longitudinal data
- They also analyze the effect of socio-demographic factors on participation
- Gundersen and Oliveira (2001) and Nord & Golla (2009) evaluated the association between food stamps and food insecurity.
 - They found more food insecurity associated with SNAP participants.
- Mabli and Ohls (2015) estimated the effect of participant in SNAP participation on food security.
 - They discovered that the SNAP participation reduced food insecurity in SNAP households by 6-17% and also severe food insecurity was reduced by 12-19%.

Literature Review

- Studies on the relation between participation in SNAP and Food Pantries
 - ❑ Daponte (2000) and Bhattarai, Duffy, and Raymond (2005) evaluated the use of food pantries and SNAP among poor households and examined the factors that affects the choice of participation in both food assistance programs
 - ❑ Bivariate Probit/logit model
 - ❑ Socio-demographics associated with participation
 - ❑ Positive correlation found between participation in SNAP and food pantries



Literature Review

- Studies on other SNAP related issues

- ❑ Carpio et al. (2014) investigated the effect of SNAP program on the distribution of food and nonfood expenditure across six subgroups.

- They found that the largest share of the total expenditure goes to food.

- ❑ Gregory et al. (2013) examined the extent to which SNAP participation affects the quality of participant's diet. They used Healthy Eating Index (HEI) to compared the scores of low-income households of participants and non-participants.

- They discovered that HEI scores are lower for participants than non-participants.



Methods

- This study analyses :
 - The effect of socio-demographics on participation in SNAP and private food charities.
 - The effect of SNAP and food charities participation on food security while accounting for endogeneity in the model.
- Results from this study aim to provide information to the policy makers on how the government-funded program and the private food reliefs independently and jointly assist in enhancing food security.

Data

- The Data used for this survey is the National Household Food Acquisition and Purchase Survey (FoodAPS) data, the data was collected between April 2012 and January 2013.
- The dataset captures both SNAP and non-SNAP participants of low-income and higher income households.
- A total of 4286 households were surveyed.
- SNAP participation is verified by the SNAP Administrative records (to avoid measurement error).
- The data contains socio-demographics for individuals as well as households.
- Food charities participation was captured by considering participation in Food bank or receiving meals from community centers.

Model 1

- Relationship between socio-demographic characteristics and participation

$$r_j^* = X'_{rj} \beta_{rj} + u_{rj}$$

For

$$r = 1 \text{ if } r^* > 0$$

$$r = 0 \text{ if } r^* \leq 0$$

- X'_{rj} = Socio-demographics
- j = individual household for $j = 1, 2, \dots, n$
- u_{rj} = random error

Model 2

Effect of participation of food programs on food security.

- Probit model
- Procedure to control for endogeneity with the use of control function approach using the results from model 1.

$$f_j^* = X'_{rj} \beta_{rj} + \delta r + \varepsilon_{rj}$$

$$f = 1 \text{ if } f_j^* > 0$$

$$f = 0 \text{ if } f_j^* \leq 0$$

for

- j =individual household for $j = 1, 2, \dots, n$.
- f = dummy variable that represents food security.
- X = socio-demographic characteristics.
- r = dummy variable that represents participation in either SNAP or food pantry.

Model 2

- ▶ Endogeneity

r = participation in food programs is considered to be endogenous

- ▶ Self Selection

- ▶ To tackle the endogeneity issues, no suitable instruments were found so we used identification of functional form (Dong, 2009).

- This works when the model is non-linear.

Econometric Procedure

► Identification.

► This involves two stages:

1. Estimating the probit model for participation and obtaining \widehat{u}_{rj}

$$\widehat{u}_{rj} = r_j - X'_{rj}\beta_{rj}$$

2. Estimating the endogeneity corrected model by adding \widehat{u}_{rj} to the food security binary model

$$f_j = X'_{rj}\beta_{rj} + \delta r + \widehat{u}\gamma + v_{rj}$$

► The non-linearity in the model is used for identification.

Results.

- Frequency table of SNAP and food charities participation.

n = 4714

		SNAP		
Food Charities		0	1	Total
	0	3022	1274	4296
1	182	236	418	
		3204	1510	4719

Summary Statistics (n=4714).

Variable	Mean	Std. Dev.	Variable	Mean	Std. Dev.
Household size	2.428	239.240	Other race	0.050	34.719
Bachelors & above	0.326	75.010	Own House	0.621	77.609
Some college & diploma	0.578	79.019	Own Car	0.897	48.695
12th grade & below	0.096	47.107	Spring	0.146	56.446
Midwest	0.314	74.268	Summer	0.520	79.933
Northeast	0.155	57.972	Fall	0.297	73.125
West	0.177	61.122	Age	50.079	2764.330
South	0.353	76.454	elder	29.902	6899.520
Married	0.446	79.523	adult	55.607	6334.700
Male	0.323	74.815	kid	4.890	2035.410
Hispanic	0.126	53.102	child	9.597	2963.020
White	0.764	67.946	Average income	5197.310	703056
Black	0.124	52.711			

Marginal effect of bivariate probit (socio-demographics on participation in both SNAP and Food charities simultaneously)

Variable	Marginal Effect	Variable	Marginal Effect
Household size	0.010***	Black	0.003
Bachelors & above	-0.014***	Houseown	-0.008***
12th grade & below	0.012***	Owncar	-0.017***
Midwest	0.007*	Spring	0.014
Northeast	-0.003	Summer	0.008
West	0.001	Fall	0.013*
Married	-0.011***	Age	0.000***
Male	-0.004	Pelder	0.000
Hispanic	-0.007**	Pkid	0.000
White	-0.003	Pchild	-0.000*
rho	0.24***	Log-income	-0.020***

Marginal Effect of Socio-demographics on SNAP/Food charities

Variable	SNAP	Food Charities	Variable	SNAP	Food charities
Household size	0.069***	0.022***	Black	0.056***	-0.014
Bachelors &above	-0.056***	-0.028***	Houseown	-0.031***	-0.014
12th grade &below	0.031**	0.027**	Owncar	-0.065***	-0.039***
Midwest	-0.003	0.025**	Spring	0.058**	0.022
Northeast	0.009	-0.010	Summer	0.025	0.021
West	-0.025**	0.012	Fall	0.024	0.033
Married	-0.075***	-0.018*	Age	0.001	0.001***
Male	-0.012	-0.005	Log-income	-0.116***	-0.034***
Hispanic	0.021	-0.027***	Pelder	0.000	0.000
White	0.015	-0.017	Pkid	0.000	0.000
			Pchild	-0.001***	-0.001**

Effect of Socio-demographics

- Household size, educational level, marital status, car ownership, income and child has same significant effect on both SNAP and Food charities.
- Household size has the largest positive effect on SNAP participation(69%).
- Educational level of 12th grade and below has the largest positive effect on Food charities program participation(27%).
- Region, race, kid and elder has different effects on the two food programs.

Marginal Effect of effect of SNAP/Food charities participation on Food Security(2nd Stage)

Variable	Marginal Effect	Residuals
SNAP	0.069**	-0.094***
Food charities	-0.174	0.054

Marginal Effect of SNAP/Food Charities participation on Food Security without controlling for endogeneity

Variable	Marginal Effect
SNAP	-0.04***
Food charities	-0.116***

Summary

➤ Effect of participation on Food Security

➤ Identification through functional forms:

- Positive and significant effect of SNAP participation on food security.
- No significant effect for the residuals of private food charities.
- No Significant effect found for private food charities on food security.

➤ Without Controlling for endogeneity:

- SNAP and Food charities participants are associated with food insecurity (This is different from the result of the model that controls for endogeneity)

Summary

- SNAP participation increases food security by 7%
- No effect was found on the participation of private food charities on food security
 - This could be due to :
 - Mismeasurement
 - Combination of data for private food charities.

Without Controlling for endogeneity shows that SNAP/Food charities recipients are associated with food insecurity but controlling for endogeneity measures the effect of participation on food security



Next Steps

- There is need to investigate more on private food charities:
 - Get the frequency of the aid.
 - The dollar equivalent of the aid per time.
 - Control for misreporting.



Thank you