# “Analyzing the relationship between SNAP Participation and Private Establishments in America’s Largest Cities During and After Recessions”

Corey Rutkin ’21

Advisor: Funda Dogruer

rutkinc@union.edu

## INTRODUCTION

Every day, Americans go hungry. Even when national unemployment is low, a measurement often referenced as a sign of a strong economy, millions of Americans go hungry. This tragedy is exacerbated during recessions. The clearest proof of this comes through the rise in Supplemental Nutritional Assistance Program (SNAP) participation. SNAP, often called food stamps, is a federal program administered across the United States to help impoverished families meet their nutritional needs. Later, I’ll break down specifically how it does that.

This isn’t a surprising phenomenon. Recessions, defined as two consecutive quarters of decline in Gross Domestic Product, are filled with business closures, and thus job loss. Many Americans’ purchasing power is strained even when they are employed.

When recessions strike, households living paycheck to paycheck are put into dangerous situations.

This paper focuses on two things. The first is the rise in SNAP participation during and after recessions. Specifically, how does the rise in SNAP participation in America’s largest cities help or hurt those city’s private businesses recover. The second is how the closure of private businesses impacts SNAP participation even after recessions end. The assumptions behind this research are clear.. When people are not fed enough, they are less healthy, and less productive. This is bad for private businesses. When private businesses close, there are more Americans at risk of food insecurity.

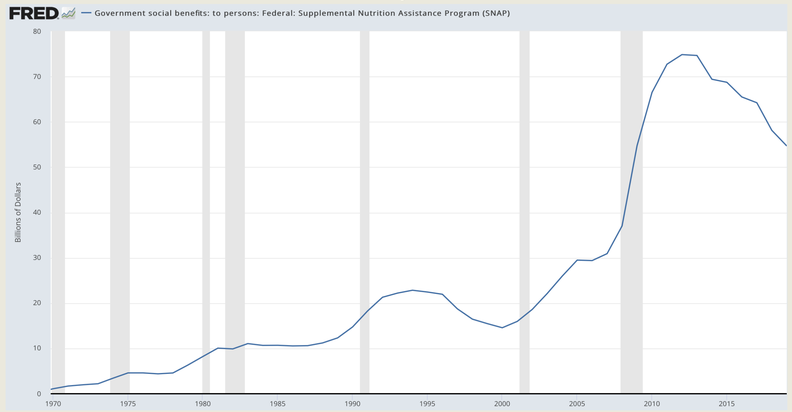


Chart 1. Spending in billions on food assistance programs in the United States since 1970. (Reference 1)

## METHODS AND MATERIALS

**Model 1:**

$$PrivEst_{i,t} = b_o + bSNAP_{i,t} + bMedInc_{i,t} + bPOP_{i,t} + bLabForce_{i,t} + \varepsilon_{i,t}$$

**Model 2:**

$$LagPrivEst_{i,t+1} = b_o + bSNAP_{i,t} + bMedInc_{i,t} + bPOP_{i,t} + bLabForce_{i,t} + bPermits + \varepsilon_{i,t}$$

**Model 3:**

$$LagSNAP_{i,t+1} = b_o + bPrivEst_{i,t_{i,t}} + bMedInc_{i,t} + bPOP_{i,t} + bLabForce_{i,t} + bPermits + \varepsilon_{i,t}$$

**Model 4:**

$$Permits_{i,t+1} = b_o + bPrivEst_{i,t_{i,t}} + bMedInc_{i,t} + bPOP_{i,t} + bLabForce_{i,t} + bSNAP + \varepsilon_{i,t}$$

- PrivateEst
  - Number of Private Establishments in county.
- SNAP
  - The number of participants in the Supplemental Nutrition Assistance Program by county.
- POP
  - Resident Population of a county.
- LabForce
  - Size of the Labor Force of a county.
- MedInc
  - Median Household Income of a county.
- Permit
  - Number of new housing structure permits granted in a county.

## RESULTS

**Model 1:**

```
. reg Private SNAP Labor MedianHH ResidentPop
```

| Source | SS | df | MS | | |
|---|---|---|---|---|---|
| Model | 2.0664e+12 | 4 | 5.1660e+11 | Number of obs | = 290 |
| Residual | 3.3452e+11 | 285 | 1.1737e+09 | F(4, 285) | = 440.13 |
| | | | | Prob > F | = 0.0000 |
| Total | 2.4009e+12 | 289 | 8.3077e+09 | R-squared | = 0.8607 |
| | | | | Adj R-squared | = 0.8587 |
| | | | | Root MSE | = 34260 |

| Private | Coef. | Std. Err. | t | P>\|t\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| SNAP | .0012517 | .0133413 | 0.09 | 0.925 | -.0250082 | .0275116 |
| Labor | .1135041 | .0285006 | 3.98 | 0.000 | .0574058 | .1696025 |
| MedianHH | .529024 | .134857 | 3.92 | 0.000 | .2635818 | .7944661 |
| ResidentPop | -20.80143 | 14.24683 | -1.46 | 0.145 | -48.84379 | 7.240937 |
| _cons | -40885.95 | 7195.04 | -5.68 | 0.000 | -55048.11 | -26723.79 |

**Model 2: fix image below there for formatting purposes**

```
reg PElag SN MHI RPop LF NewH
```

| Source | SS | df | MS | | |
|---|---|---|---|---|---|
| Model | 2.3026e+12 | 5 | 4.6051e+11 | Number of obs | = 270 |
| Residual | 1.4293e+11 | 264 | 541392814 | F(5, 264) | = 850.60 |
| | | | | Prob > F | = 0.0000 |
| Total | 2.4455e+12 | 269 | 9.0910e+09 | R-squared | = 0.9416 |
| | | | | Adj R-squared | = 0.9404 |
| | | | | Root MSE | = 23268 |

| PElag | Coef. | Std. Err. | t | P>\|t\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| SN | -.0144288 | .0083342 | -1.73 | 0.085 | -.0308388 | .0019812 |
| MHI | .4168154 | .1011398 | 4.12 | 0.000 | .217672 | .6159587 |
| RPop | -.0025092 | .0008252 | -3.04 | 0.003 | -.0041339 | -.0008844 |
| LF | .077721 | .0020507 | 37.90 | 0.000 | .0736833 | .0817588 |
| NewH | -.5118967 | .1345359 | -3.80 | 0.000 | -.7767966 | -.2469967 |
| _cons | -43216.77 | 5549.513 | -7.79 | 0.000 | -54143.71 | -32289.83 |

**Model 3:**

```
. reg SNlag PE PElag LF MHI NewH RPop
```

| Source | SS | df | MS | | |
|---|---|---|---|---|---|
| Model | 2.8481e+13 | 6 | 4.7468e+12 | Number of obs | = 270 |
| Residual | 7.6953e+12 | 263 | 2.9260e+10 | F(6, 263) | = 162.23 |
| | | | | Prob > F | = 0.0000 |
| Total | 3.6176e+13 | 269 | 1.3448e+11 | R-squared | = 0.7873 |
| | | | | Adj R-squared | = 0.7824 |
| | | | | Root MSE | = 1.7e+0 |

```
> 5
```

| SNlag | Coef. | Std. Err. | t | P>\|t\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| PE | -3.674047 | 1.848814 | -1.99 | 0.048 | -7.314408 | -.0336846 |
| PElag | 3.031892 | 1.887597 | 1.61 | 0.109 | -.6848328 | 6.748617 |
| LF | .2424119 | .0352948 | 6.87 | 0.000 | .1729157 | .3119082 |
| MHI | -1.315006 | .763866 | -1.72 | 0.086 | -2.819077 | .1890653 |
| NewH | -3.920237 | .9730104 | -4.03 | 0.000 | -5.836119 | -2.004356 |
| RPop | .0539786 | .0051798 | 10.42 | 0.000 | .0437795 | .0641777 |
| _cons | 118473.1 | 44629.76 | 2.65 | 0.008 | 30596.01 | 206350.2 |

**Model 4:**

```
. gen LagOneNH = NH[_n-1]
(19 missing values generated)

. reg LagOneNH SNAP Private LFP MHI RP
```

| Source | SS | df | MS | | |
|---|---|---|---|---|---|
| Model | 9.5813e+09 | 5 | 1.9163e+09 | Number of obs | = 280 |
| Residual | 2.3392e+10 | 274 | 85371221.9 | F(5, 274) | = 22.45 |
| | | | | Prob > F | = 0.0000 |
| Total | 3.2973e+10 | 279 | 118182700 | R-squared | = 0.2906 |
| | | | | Adj R-squared | = 0.2776 |
| | | | | Root MSE | = 9239.7 |

| LagOneNH | Coef. | Std. Err. | t | P>\|t\| | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| SNAP | -.021 | .0036329 | -5.78 | 0.000 | -.028152 | -.013848 |
| Private | -.0985664 | .0164914 | -5.98 | 0.000 | -.1310325 | -.0661004 |
| LFP | .0331849 | .0083096 | 3.99 | 0.000 | .016826 | .0495437 |
| MHI | -.0191454 | .0385454 | -0.50 | 0.620 | -.0950282 | .0567374 |
| RP | -9.571534 | 4.018066 | -2.38 | 0.018 | -17.48174 | -1.66133 |
| _cons | 7965.992 | 2129.282 | 3.74 | 0.000 | 3774.16 | 12157.82 |

## CONCLUSIONS

- Models 1 and 2 showed that SNAP doesn’t have a significant impact on Private Establishments, even when private establishments is lagged one year back.
- Model 3
  - We can see that changes in the number of private establishments does have a significant effect on the number of SNAP participants 1 year.
  - For every business that opens, nearly 4 less people are on SNAP.
- Model 4
  - For every 100 people on SNAP, one less structure is granted a permit.

## REFERENCES

1. https://fred.stlouisfed.org/series/TRP6001A027NBEA
2. All econometric regressions were calculated using STATA