SNAP Benefit and Labor Supply: New Evidence from Taxi Drivers

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Introduction

As the largest federal safety net program in the United States, the Supplemental Nutrition Assistance Program (SNAP) serves over 40 million people in 2018. The program provides monthly benefits to supplement a family's food budget and the spending on SNAP peaked at $80 million in 2013. The expansion of SNAP caseloads following the Great Recession and the COVID pandemic raised a debate over whether SNAP disincentivized people from work and whether SNAP caseload should be reduced to encourage participants to work more. To provide evidence of whether public assistance program discourage work, this paper looks at the labor supply of NYC taxi drivers when the federal American Recovery and Reinvestment Act (ARRA) temporary increase to SNAP benefits expired in 2013.

Background

The federal American Recovery and Reinvestment Act of 2009 (ARRA) temporarily increased the amount of the Thrifty Food Plan (TFP) amounts used by the federal government to calculate federal SNAP benefits since April 1, 2009. As a result, the maximum allowable monthly SNAP allotments increased by 13.6%. This temporary increase to the TFP amounts expired on November 1, 2013. The SNAP amount participants receive decreased from November 1, 2013, as the consequence.

Taxi drivers are in the industry with largest share of SNAP participants, 17.4% verses 10% across all industries.1 They work in a setting where they are free to set hours of work. Prior papers have used the taxi market as a useful environment to study labor supply decisions because drivers have more flexibility in deciding when to stop than workers employed in firms. The flexibility of cabdrivers' working hours allows for the detection of the short-run labor supply responses to changes in SNAP benefits of a policy-relevant population.

Conceptual Framework

Canonical labor-leisure choice model

$$U=f(C,L)$$
$$C=wh+V$$

where consumption is C, hours of leisure is L, hours of work is h, w is exogenous wage rate, V is non labor income. The budget constraint can also be written as

$$C=(wT+V)-wL$$

SNAP benefit = cost of Thrifty Food Plan – 30% net income

Graphic illustration of the effect of SNAP on hours of work decision in Figure 1 and Figure 2. If money is fungible, transfer with tax on labor income must reduce hours of work (B to C).

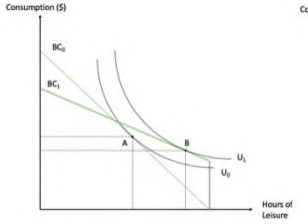

Figure 1. Effect of SNAP on labor supply decision

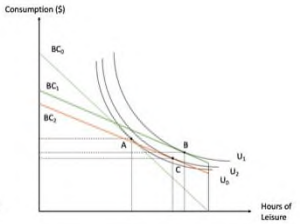

Figure 2. Effect of SNAP reduction on labor supply

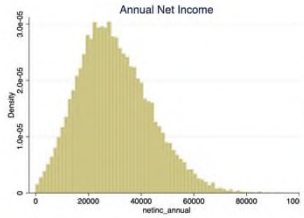

Figure 3. Imputed income of NYC drivers from TLC

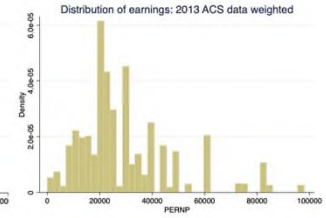

Figure 4. Earnings distribution of NYC drivers from ACS

	(1) duration	(2) Riding time	(3) fares
post	-0.288***	1.456***	-6.225***
	(0.0752)	(0.0413)	(2.397)
SNAPrate	-23.69***	-15.02***	-907.6***
	(0.222)	(0.120)	(6.698)
post*SNAPrate	1.980***	1.030***	77.69***
	(0.224)	(0.126)	(7.053)
Weather FE	v	v	v
Calendar week	v	v	v
Month	v	v	v
Holiday	v	v	v
N	5,336,185	5,336,185	5,336,185

Standard errors in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 1. Effect of the benefit cut, 2013 data

	(1) duration	(2) Riding time	(3) fares
post	-5.248***	-8.078***	-398.5***
	(0.145)	(0.0771)	(4.470)
SNAPrate	-23.86***	-15.26***	-922.6***
	(0.273)	(0.155)	(8.527)
post*SNAPrate	2.176***	1.310***	94.41***
	(0.224)	(0.125)	(7.089)
Weather FE	v	v	v
Calendar week	v	v	v
Month	v	v	v
Holiday	v	v	v
N	1,966,809	1,966,809	1,966,809

Standard errors in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 2. Effect of the benefit cut, 2013 Aug-Dec data

	(1) duration	(2) Riding time	(3) fares
post	-1.766***	0.380***	187.1***
	(0.110)	(0.0618)	(3.443)
SNAPrate	-18.06***	-11.82***	-619.7***
	(0.222)	(0.123)	(5.870)
post*SNAPrate	-9.473***	-5.578***	-392.5***
	(0.426)	(0.246)	(13.71)
Weather FE	v	v	v
Calendar week	v	v	v
Month	v	v	v
Holiday	v	v	v
N	4,538,282	4,538,282	4,538,282

Standard errors in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 3. Placebo test, 2012 data

	(1) duration	(2) Riding time	(3) fares
post	4.615***	4.938***	184.9***
	(0.243)	(0.138)	(7.960)
SNAPrate	-31.49***	-20.04***	-1156.6***
	(0.433)	(0.247)	(13.50)
post*SNAPrate	3.962***	2.656***	145.1***
	(0.385)	(0.224)	(12.67)
Weather FE	v	v	v
Calendar week	v	v	v
Month	v	v	v
Holiday	v	v	v
N	1,208,895	1,208,895	1,208,895

Standard errors in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 4. Placebo test, 2012 Aug-Dec data

Data and Methods

Trip record of yellow taxis from the NYC Taxi & Limousine Commission (2010-2013). Each record includes

- anonymized id numbers for the driver and car, id varies across years
- start and end times for each trip
- pick-up and drop-off locations
- fares charged and tips paid by credit cards

Using the benefit cut as an exogenous shock in SNAP benefit levels, the Difference-in-Difference model below is estimated:

$$y_{it}=\beta_0+\beta_1\cdot SNAPrate_i+\beta_2\cdot Post_t+\beta_3\cdot SNAPrate_i\cdot Post_t+\boldsymbol{\gamma}\cdot\boldsymbol{X_{it}}+\varepsilon_{it}$$

y_{it} : measure of labor supply (weekly hours worked, riding time, fares)
$SNAPrate_i$: fitted probability of participation in SNAP
$Post_t$: indicator of period after the benefit cut in Nov 1, 2013
$\boldsymbol{X_{it}}$: time fixed effects (calendar week, month, holiday), weather effects

Results and Discussion

- A one percentage point increase in the probability of participating in SNAP is associated with drivers spending 1.98 hours more driving the taxi, spending 1.03 hours more riding with passengers, and collecting 77.69 dollars more in an average week after the benefit cut.
- Restricting analysis to two months before and after the cut generates higher estimate of the treatment effect.
- To test for seasonality, the model is replicated using data of 2012. Inspecting all year data, the average work efforts are lower in the latter two months of the year. But restricting analysis to the last four months in the year, results show increased working hours during Nov and Dec. This suggest anticipation of the cut and increased labor supply prior to the intervention among drivers to cope with the anticipated drop in November.
- Need to find better ways to deal with seasonality in the main analysis.

References

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[2] East, C. N. (2018). Immigrants' labor supply response to Food Stamp access. Labour Economics, 51, 202-226.
[3] Bitler M., Cook J., & Rothbaum J. (2021). Working for Your Bread: The Labor Supply Effects of SNAP. American Economic Review: Papers and Proceedings, 111, 496-500.