

Economywide Impacts of the Supplemental Nutrition Assistance Program (SNAP)

Jessica Osanya

Applied Economics PhD Student
Oregon State University



osanyaj@oregonstate.edu



[linkedin.com/in/jessica-o-97847075/](https://www.linkedin.com/in/jessica-o-97847075/)

SNAP as a way to alleviate food security

- 37.9 million U.S. citizens living in poverty in 2021 (12%)
- Federal government has policies to mitigate poverty
 - SNAP is the largest food and nutrition assistance program
 - SNAP spending in 2021: \$113 billion (2.5% of federal govt spending)
- Programs like SNAP intended to alleviate food insecurity
 - Differing viewpoints on the effectiveness of these programs
 - Critics express skepticism due to fiscal burden of the program
- **These differing views suggest that federal programs should be evaluated**

SNAP as a way to alleviate food security

- Most research that evaluates impact of SNAP:
- Analyzes the household and individual-level impacts on socio-economic indicators. e.g.
 - Food security (Mabli and Ohls, 2015, Swann, 2017), nutrient intake (Yen, 2010), child development (De Cuba et al., 2019), school performance (Bond et al., 2021)
- Gap in economics literature: Few studies look at broader impacts of programs on whole economy
 - Businesses in sectors that may expand or shrink due to SNAP
 - Prices
 - People and businesses whose taxes support SNAP

Motivation

Purpose of the study:

- Quantify the economy-wide effects of the contribution of SNAP to wellbeing of households using a general equilibrium approach
 - Including those households and economic sectors that do not receive direct benefits

Research question:

How do the following change due to SNAP?

- Spending on food and other items by low-income SNAP-receiving households
- Spending by higher-income non-receiving households (who pay taxes which may help fund SNAP, and face changed prices)
- Demand for agricultural products, food at retail level, other products
- Changes in production due to SNAP
- Demand for factors of production (L,K) used in various sectors

About SNAP

- Established through the Food Stamps Act in 1964
- Eligibility is determined by households' gross monthly income, net income and assets (gross income below 130% poverty line)
- Households receive funds through an Electronic Benefits Transfer (EBT) card monthly for food purchase from authorized retailers
- In 2019, about 36 million households received SNAP transfers, worth \$56 billion (1.4% of the mandatory federal budget)
 - Average monthly benefit was about \$130 per person or \$258 per household

Methodology

- GE model based on single-country model of Lofgren (2002)
 - calibrated with Social Accounting Matrix (SAM) for the USA (IMPLAN data) - 2019
 - assumes that households maximize utility, firms maximize profits
 - can allow for non-standard assumptions about factor market clearing (e.g. unemployment; immobility of K)
 - households have linear expenditure system
 - firms have Leontief- CES production ($L + K + \text{intermediate inputs}$)

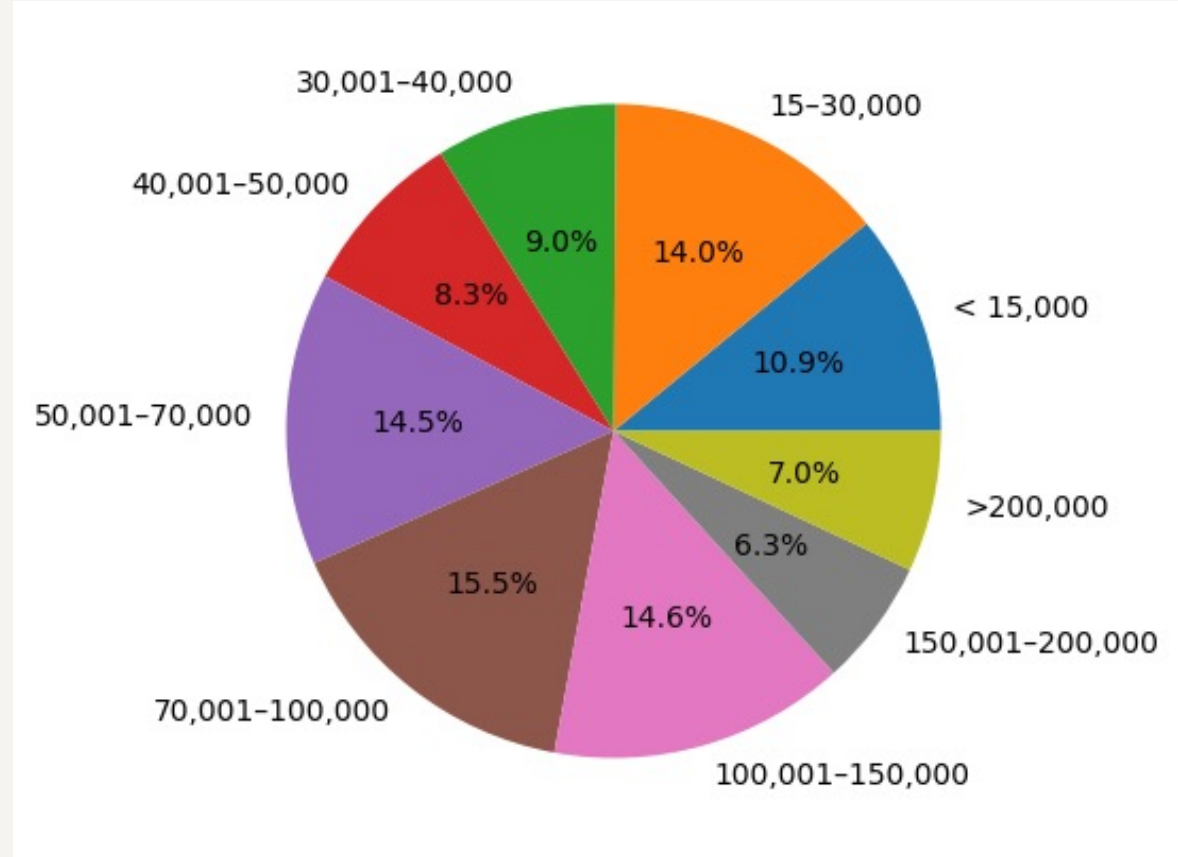
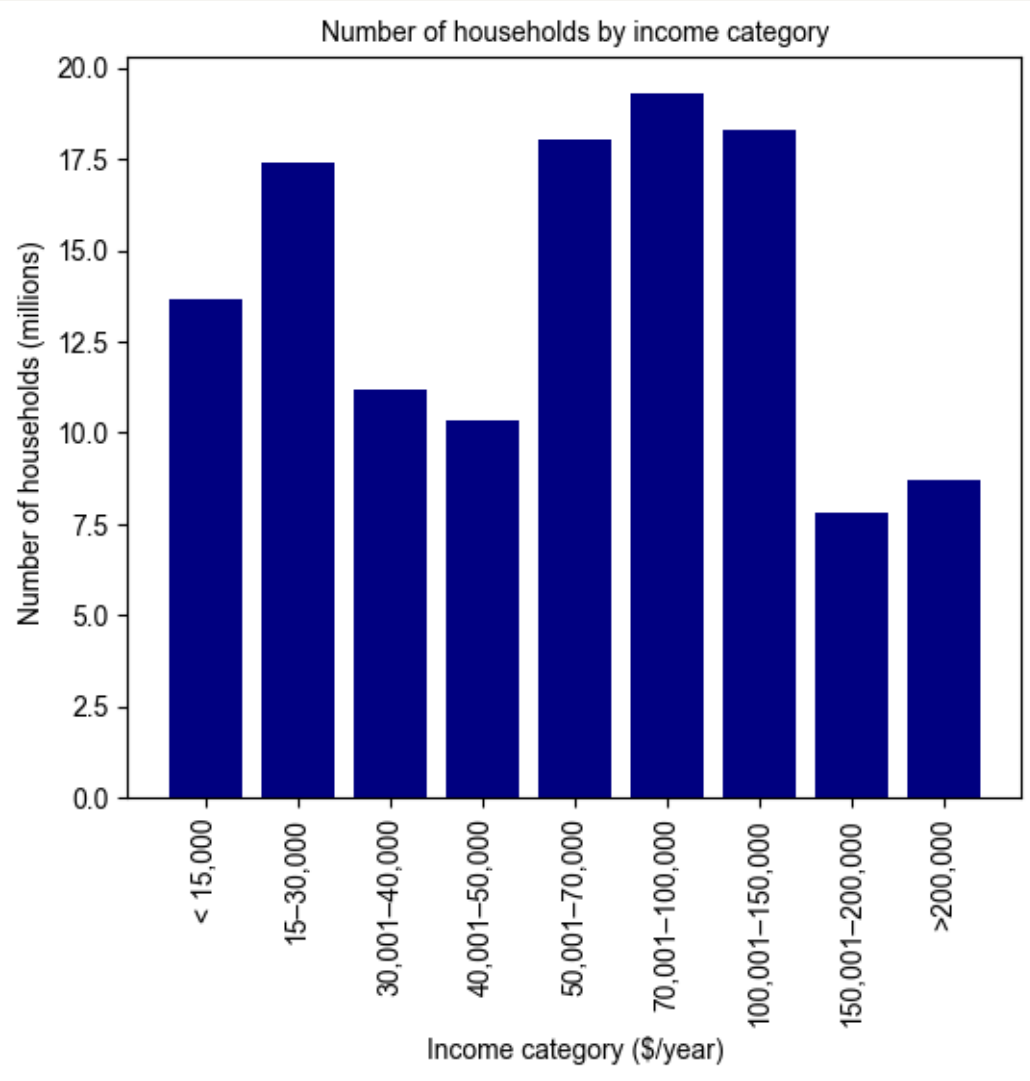
Methodology

- Model differs from basic IFPRI model – adapted to study SNAP in USA
 - distinguish 9 representative households (instead of 1)
 - households have different income profiles (L + K + government transfers)
 - different income elasticities of demand by household, for multiple goods and services
 - 19 production activities - higher breakdown of food and ag, to better match focus of SNAP
 - includes detail on U.S. federal tax revenue and tax payments across 9 households

Methodology

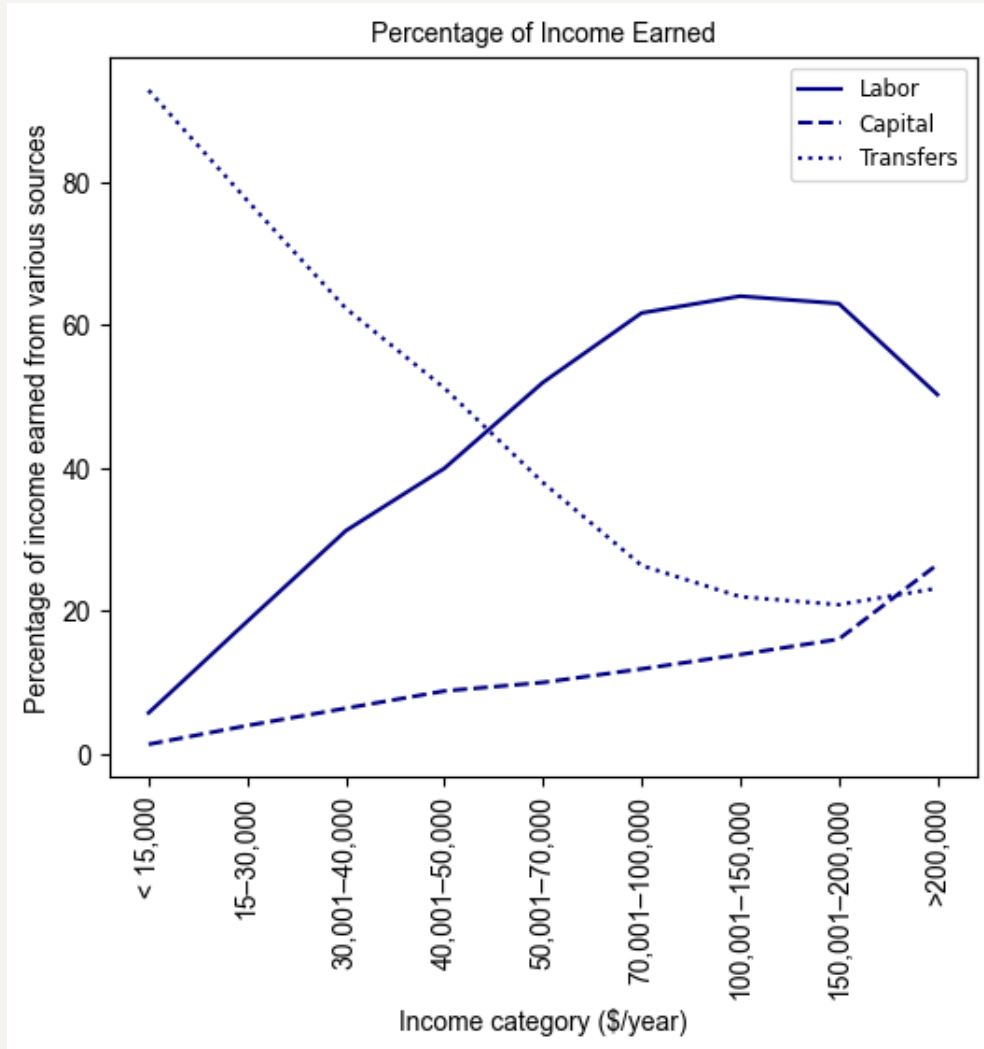
- Expenditure elasticities for food and Frisch parameters are derived from previous literature
- Tax rates are exogenous
- A short-run setting is modeled, where the supply of capital and labor are assumed to be fixed but mobile between sectors.
- Scenario assumes that in the absence of SNAP, taxes are given back to the households in the proportion that their taxes contribute to SNAP
- Calculate how the subsidies and taxes would change for each household if there was no SNAP
- The GE model is then forced to find a new equilibrium solution under this change

Profile of U.S. households in 2019 with SNAP as it existed

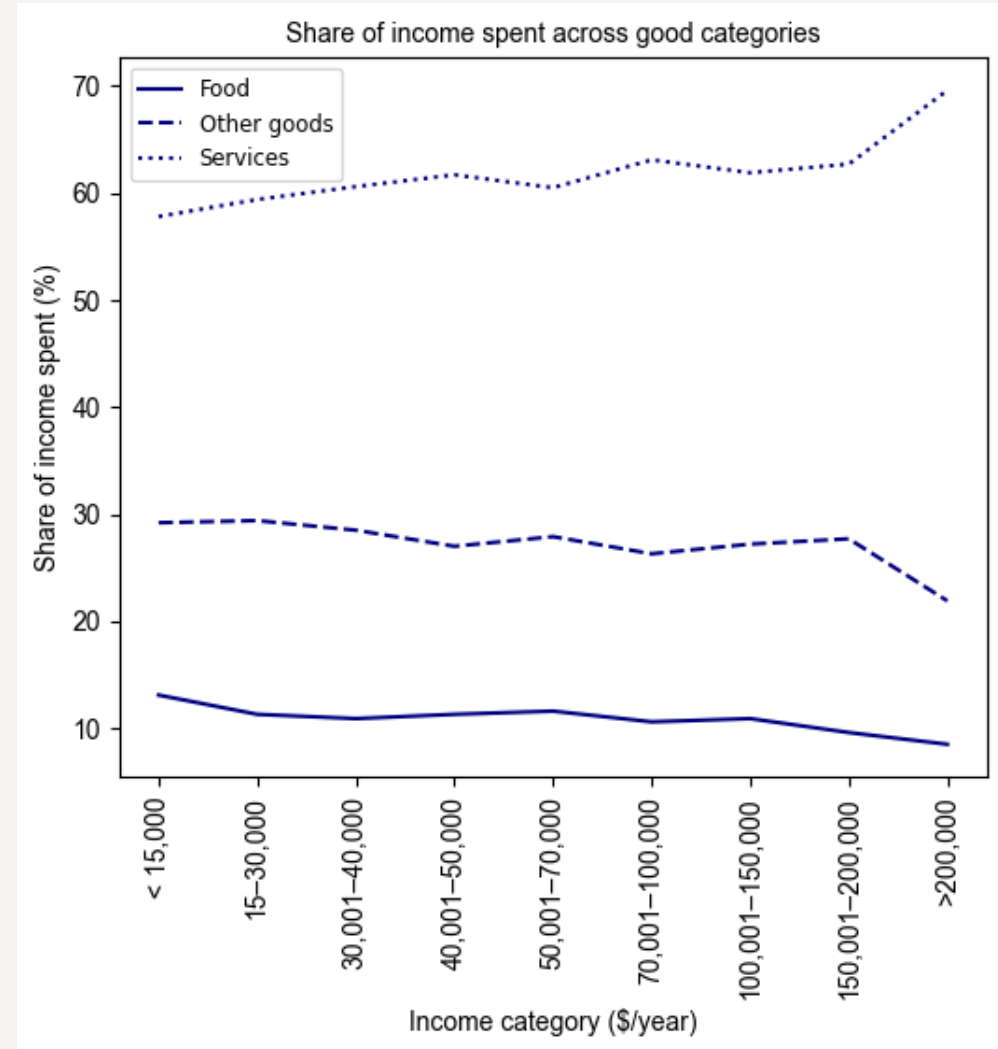


24.9% of households eligible for SNAP

Profile of U.S. households in 2019 with SNAP as it existed

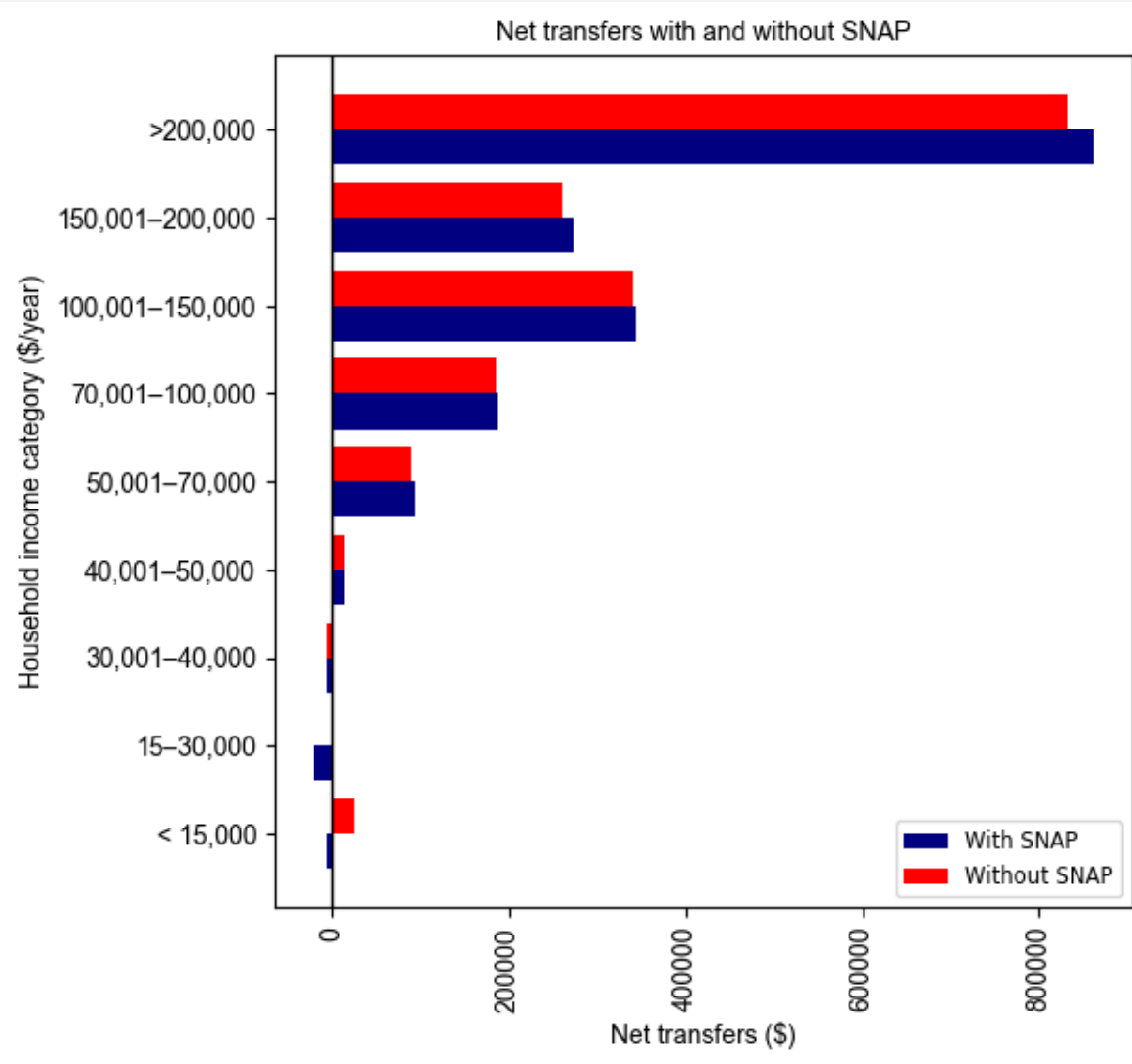


- Low-income households receive most income from transfers



- Largest share of spending is on services: 57.8-69.6%
- Share of spending on food reduces with income (Engel's Law)

Counterfactual Design for SNAP



Household categories 1 and 2 eligible for SNAP

Average amount of SNAP received/household:

- HH1 - \$ 2,282/year
- HH2 - \$ 1,406/year

With SNAP:

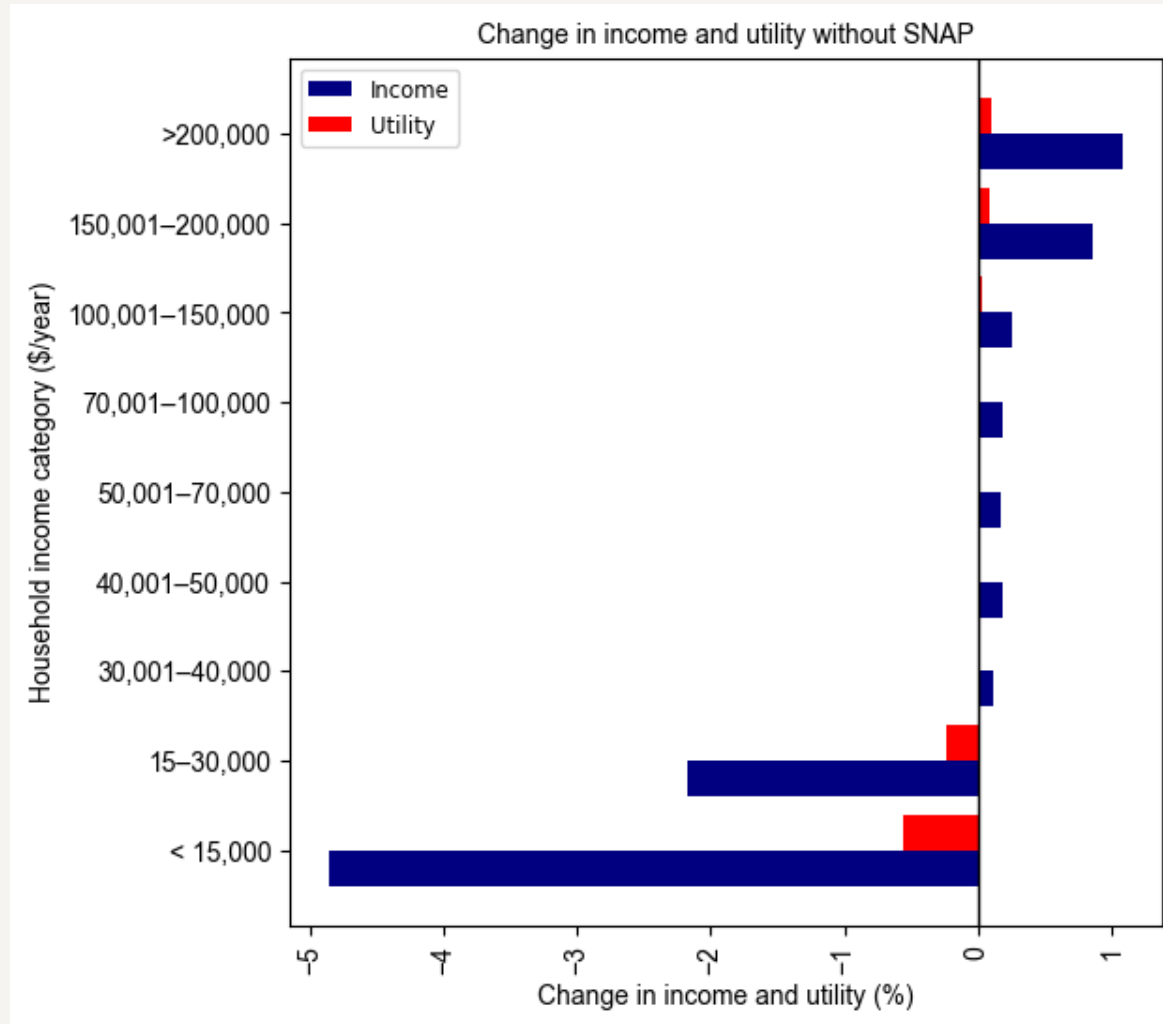
- HH1 receives net transfers of \$ 6 billion
- HH2 receives net transfers of \$ 21 billion

Without SNAP:

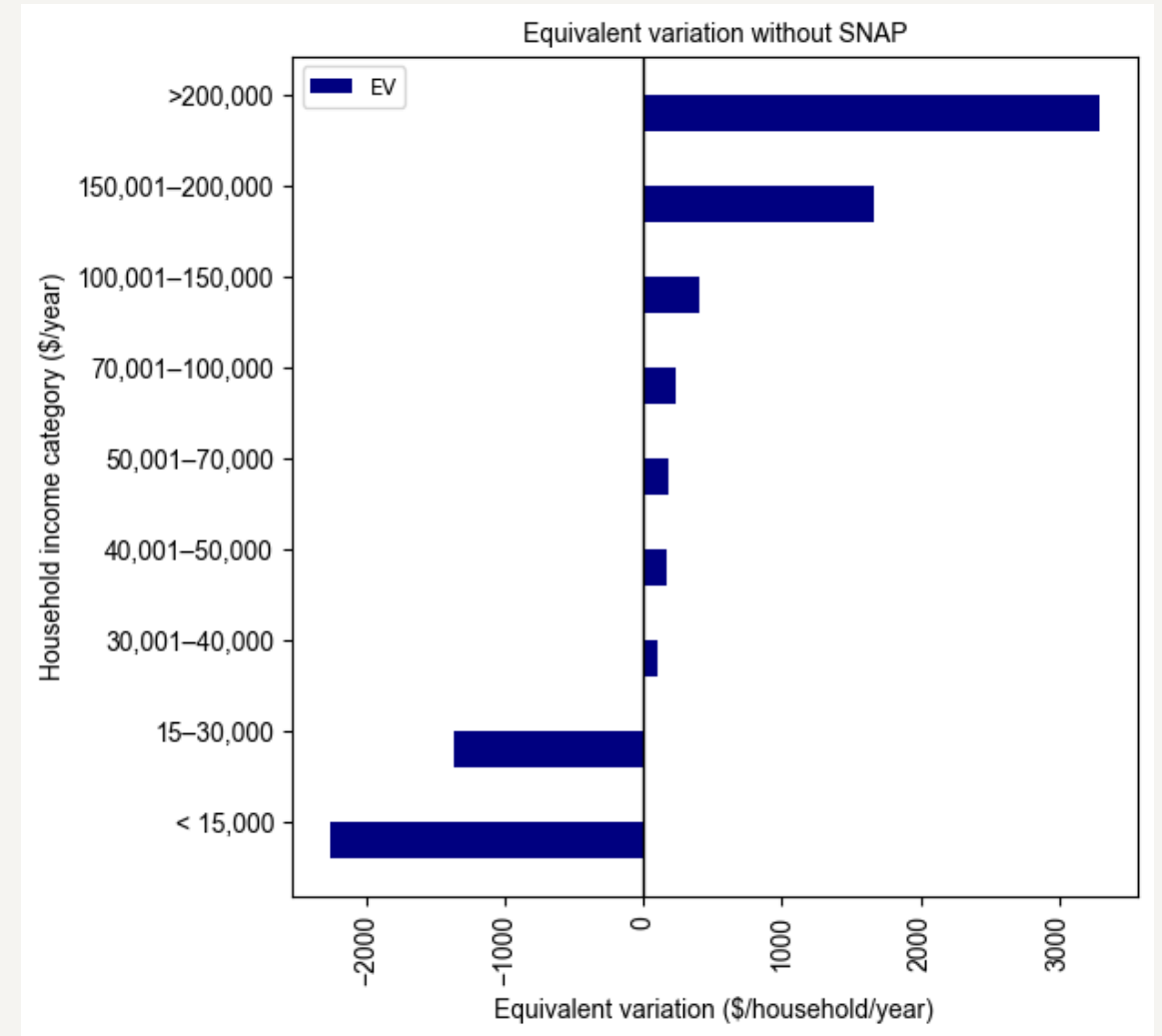
- HH1 pays net taxes of \$ 25 billion
- HH2 pays net taxes of \$ 2.5 billion

Results

Household effects of changing from SNAP to no-SNAP equilibrium

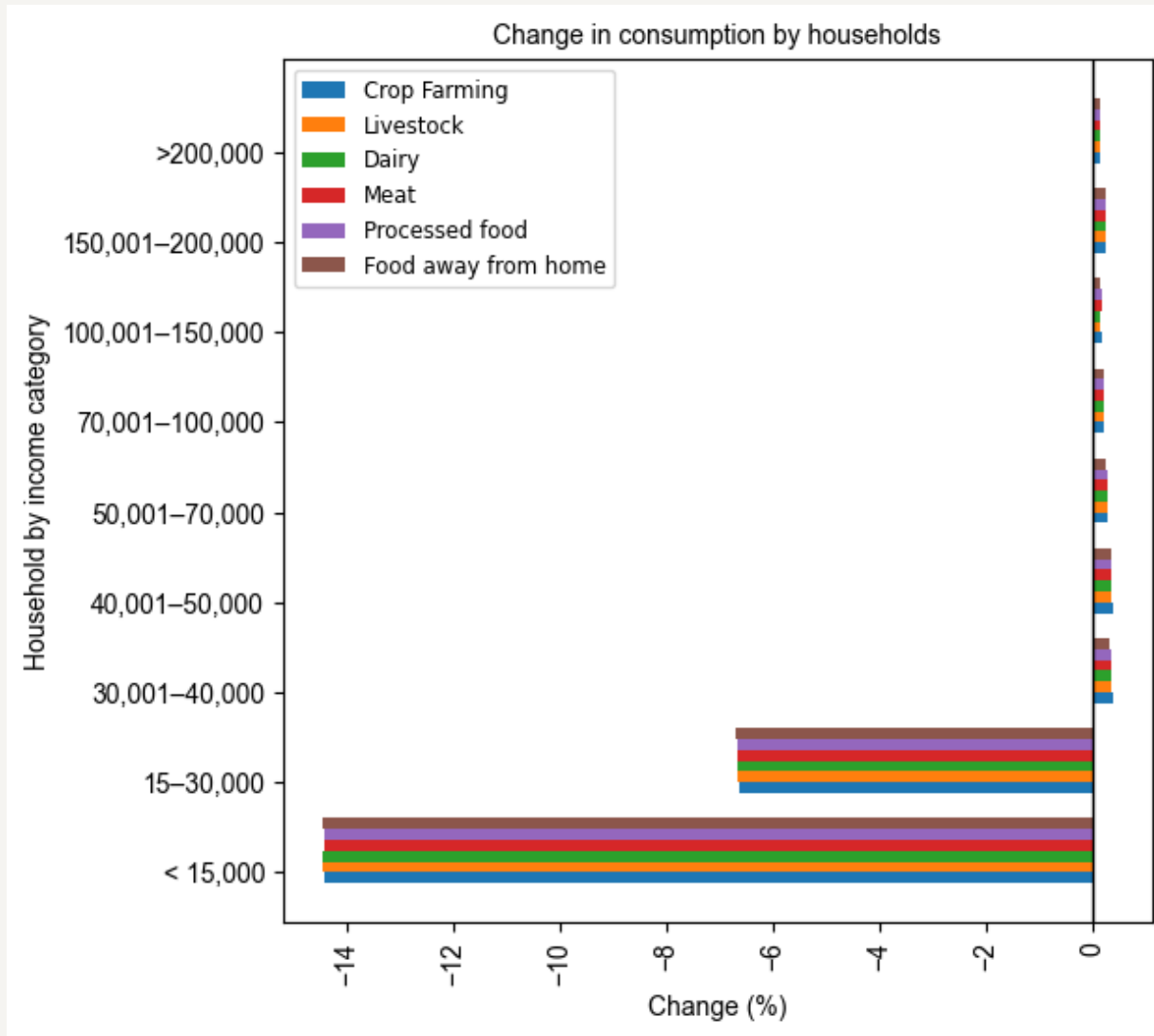


Without SNAP, HH1 and HH2 would have a reduced net income of about 5% and 2% respectively



EV is for HH1 and HH2 is -2,265 and -1,366 respectively

Changes in consumption of food and ag. by households without SNAP

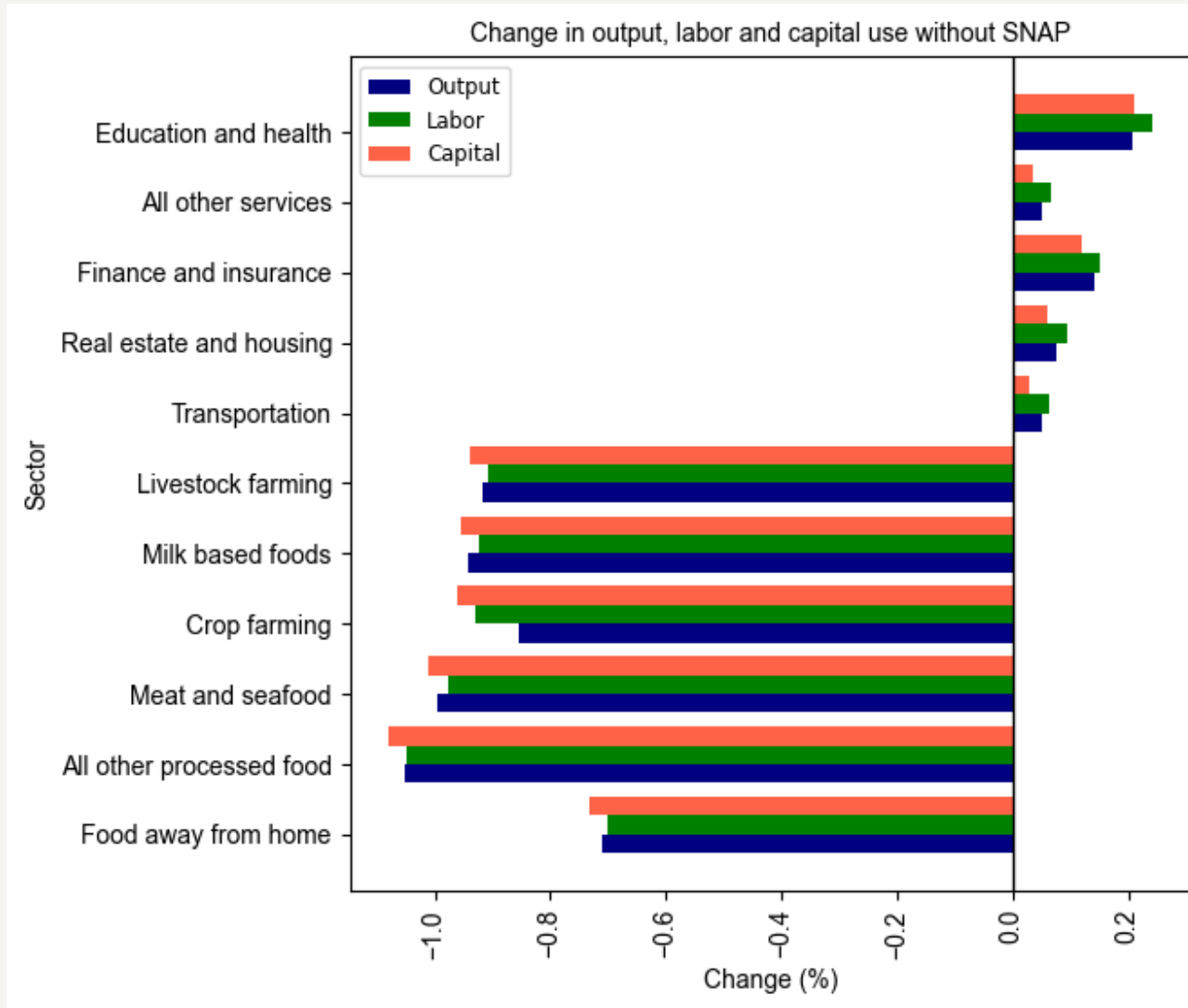


Without SNAP:

- HH1 reduces consumption of food and ag. products by about 14%
- HH2 reduces consumption of food and ag. products by about 6%

Higher income households increase consumption of these products by negligible amounts (0.1-0.3%)

Major sector results: Changing from SNAP to no-SNAP equilibrium



Without SNAP:

Food and ag. sectors would experience:

- Reduced output by about 1%
- Reduced labor and capital demand by about 1%
- Service sectors experience 0.1-0.2% increases in output

Conclusion

- Overall, this study finds that SNAP makes an economically significant positive impact on the households that receive it
- It also has small, positive impacts on the agricultural and food-processing sectors
- There are small welfare losses among higher-income households, but these are a tiny proportion (negligible) to those households

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SUPPLEMENTAL SLIDES

Profile of U.S. households in 2019 with SNAP as it existed

Household	Income category (\$/year)	Number of households	Spending on food including food away from home (%)	Spending on other goods (%)	Spending on services (%)	Labor's share of earnings (%)	Capital's share of earnings (%)
1	< 15,000	13,646,344	13.1	29.2	57.8	80.8	19.2
2	15–30,000	17,413,546	11.3	29.4	59.4	82.3	17.7
3	30,001–40,000	11,207,441	10.9	28.5	60.6	83.0	17.0
4	40,001–50,000	10,353,287	11.3	27.0	61.7	81.9	18.1
5	50,001–70,000	18,041,344	11.6	27.9	60.5	83.8	16.2
6	70,001–100,000	19,325,908	10.6	26.3	63.1	83.8	16.2
7	100,001–150,000	18,276,414	10.9	27.2	61.9	82.1	17.9
8	150,001–200,000	7,831,829	9.6	27.7	62.7	79.7	20.3
9	>200,000	8,709,787	8.5	21.9	69.6	65.5	34.5

Counterfactual Design for SNAP

Household	Net transfers to federal government (all in this category, \$ millions)		Total income including from L, K, and transfers (\$ millions)	Effective income tax rate		Average SNAP benefits received per year (\$/hhld)	Average taxes paid for SNAP (\$/hhld)
	With SNAP	Without SNAP		With SNAP	Without SNAP		
1	-6,004	25,031	631,906	-0.010	0.040	2,282	8
2	-21,539	2,548	1,091,307	-0.020	0.002	1,406	22
3	-5,985	-6,986	921,859	-0.006	-0.008	0	89
4	14,918	13,416	970,505	0.015	0.014	0	145
5	92,787	90,006	1,975,430	0.047	0.046	0	154
6	188,043	184,372	2,708,529	0.069	0.068	0	190
7	343,785	338,779	3,662,727	0.094	0.092	0	274
8	273,519	260,726	2,295,878	0.119	0.114	0	1,633
9	860,878	832,510	5,293,921	0.163	0.157	0	3,257

Results

Household effects of changing from SNAP to no-SNAP equilibrium

Household	Income category (\$/year)	Net household income (%)	Stone-Geary utility (%)	Equivalent variation (\$/hhld per year)	Number of households	Weighted equivalent variation
1	< 15,000	-4.86	-0.56	-2,265	13,646,344	-30,908,969,160
2	15–30,000	-2.17	-0.23	-1,366	17,413,546	-23,786,903,836
3	30,001–40,000	0.12	0.01	100	11,207,441	1,120,744,100
4	40,001–50,000	0.18	0.02	160	10,353,287	1,656,525,920
5	50,001–70,000	0.17	0.02	174	18,041,344	3,139,193,856
6	70,001–100,000	0.19	0.02	228	19,325,908	4,406,307,024
7	100,001–150,000	0.26	0.03	408	18,276,414	7,456,776,912
8	150,001–200,000	0.86	0.09	1,670	7,831,829	13,079,154,430
9	>200,000	1.08	0.10	3,288	8,709,787	28,637,779,656
1-9	All combined				124,805,900	4,800,608,902

Major sector results: Changing from SNAP to no-SNAP equilibrium

Sector	Price (%)	Output (\$ million)	Output (%)	Labor use (\$ million)	Labor use (%)	Capital use (\$ million)	Capital use (%)
Food away from home	-0.002	-7,392	-0.711	-100,997	-0.701	-1,150	-0.733
All other processed food	-0.019	-5,083	-1.053	-13,064	-1.049	-591	-1.081
Meat and seafood	-0.019	-3,199	-0.995	-6,388	-0.978	-135	-1.010
Crop farming	-0.026	-2,261	-0.856	-23,571	-0.929	-739	-0.961
Milk based foods	-0.010	-1,560	-0.942	-2,380	-0.922	-139	-0.955
Livestock farming	-0.010	-1,474	-0.916	-9,169	-0.908	-389	-0.940
Petrochemicals	-0.005	-723	-0.052	-462	-0.029	-160	-0.061
Energy	0.002	-422	-0.023	-99	-0.006	-176	-0.038
Alcohol and tobacco	-0.006	-263	-0.136	-313	-0.102	-49	-0.134
Mining	0.004	-11	-0.009	27	0.009	-9	-0.023
Apparel and textiles	-0.024	60	0.070	393	0.090	3	0.058
Construction	-0.001	91	0.05	2,142	0.018	-65	-0.015
All other manufacturing	-0.009	156	0.004	1,810	0.021	-58	-0.012
Wholesale retail trade	0.002	404	0.011	5,387	0.023	-63	-0.010
Transportation	0.002	738	0.051	7,282	0.062	73	0.030
Real estate and housing	0.012	2,852	0.075	8,156	0.094	1,274	0.061
Finance and insurance	0.004	4,488	0.140	15,822	0.152	912	0.120
All other services	-0.001	5,993	0.052	50,819	0.066	813	0.034
Education and health	-0.005	6,744	0.206	64,605	0.243	648	0.211

Alternative Assumptions

1. Aggregation of sectors and households

- 2 households: (SNAP and no SNAP) and 3 economic sectors (food and agriculture, manufacturing and services)
- Results show little difference: Food and ag sector shrinks by about 1% or \$24,381 million

2. Factor market assumptions

- Labor supply is variable
- Results show food and ag sector shrinks by about 0.7% or \$14,679 million

3. Expenditure elasticities of demand for food

- Using lower and upper bound elasticities of demand for food, the change in output for food and agricultural sectors is about 0.5% (\$10,485 million) on average

Confidence intervals for key results

