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# The Total Economic Impact of Philadelphia's Beverage Tax: Child Daycare and Labor Market Services

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# Special Thanks



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# Overview

- Sugary Beverage Tax operational in 2017
- Since, averaged City revenues of \$77 million & has a capacity of 3,300 childcare seats
  - ✓ Most analyses about negatively impacted industries (partial analyses)
  - ✓ One on economic benefits of child day care (partial analysis)
  - ✓ None on effect on labor supply—an outcome of daycare availability
- Our model depicts entire Philadelphia economy
  - ✓ 42 sectors with detail on
    - “key industries”
    - targeted household income groups
  - ✓ Tax accounts
- We shock it with the tax and enable modest increases in labor supply.
  - ✓ No accounting for nonpecuniary social benefits (e.g. healthier consumption)
- ***Worst case***: tax-funded programs nearly pay for themselves and Philly hardly worse off
- ***Best case***: Clear favorable outcome with only distributors “losing”



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# Key features of Philadelphia Beverage Tax

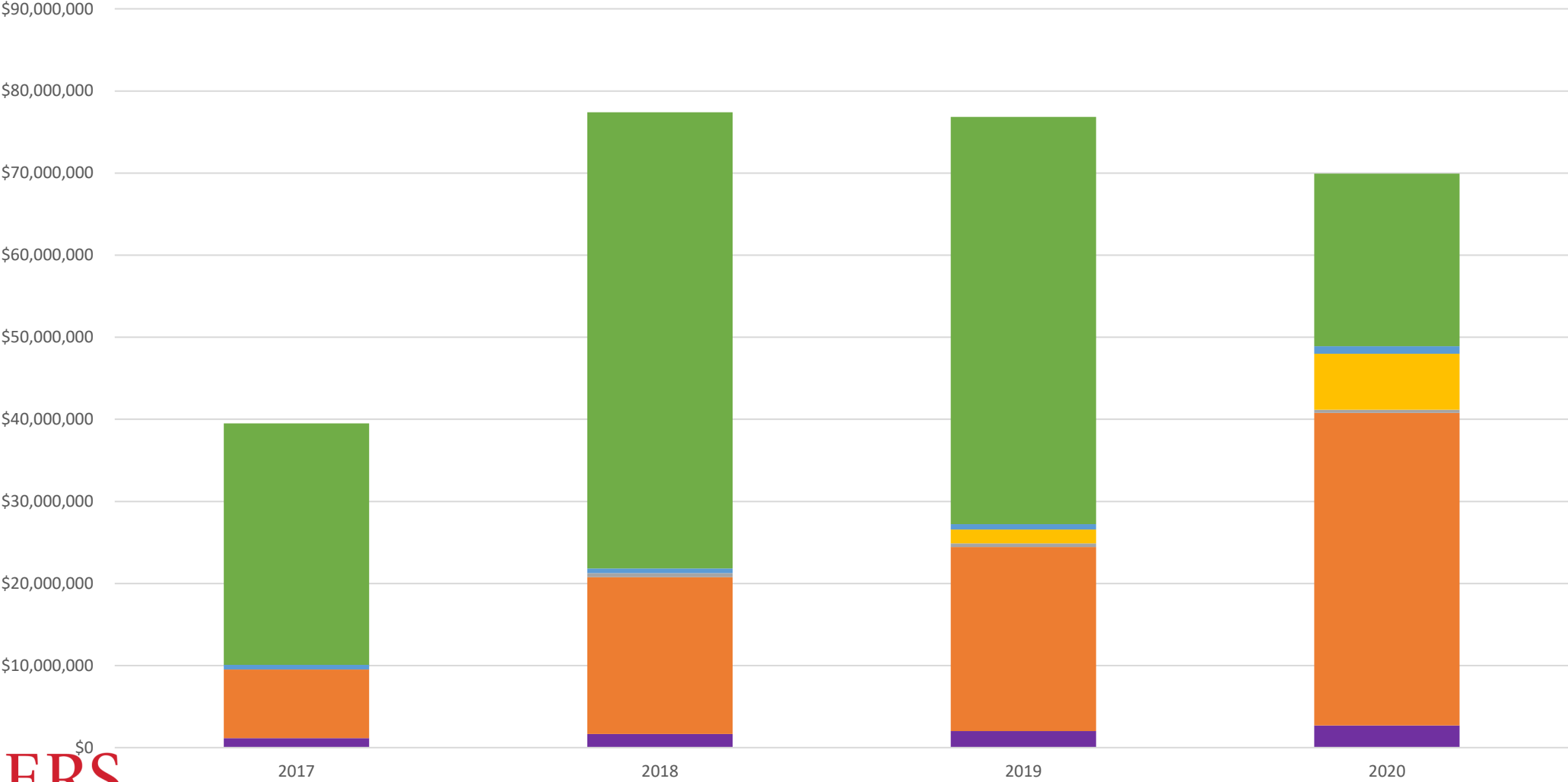
- Economic rationale:
  - To explicitly include the health costs of the beverages in their price
- 1.5 cents per ounce of beverage
- PHLpre-K averaged
  - ✓ securing 32.5% of \$77 million in tax revenues (more in 2020)
  - ✓ 3,300 subsidized pre-K seats
    - In 130+ locations
    - To families below 200% of poverty level
      - Minimum of 5.5 hours/day with parents working or
      - Educated at least 20 hrs/wk



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# Uses of Philadelphia's Beverage Tax by Fiscal Year 2017-2020



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Community Schools   Pre-K   Parks & Recreation, Rebuild   Debt Service, Rebuild   Office of Education   General Fund

# Purposes of This Research

1. What is Philadelphia's economic short-run response to the tax?
2. What are the economic benefits of the programs it funds?
  - a. PHLpre-K and related neighborhood programs
  - b. City's general fund
  - c. Increase in labor supply (assume 2,000-4,000 new jobs)



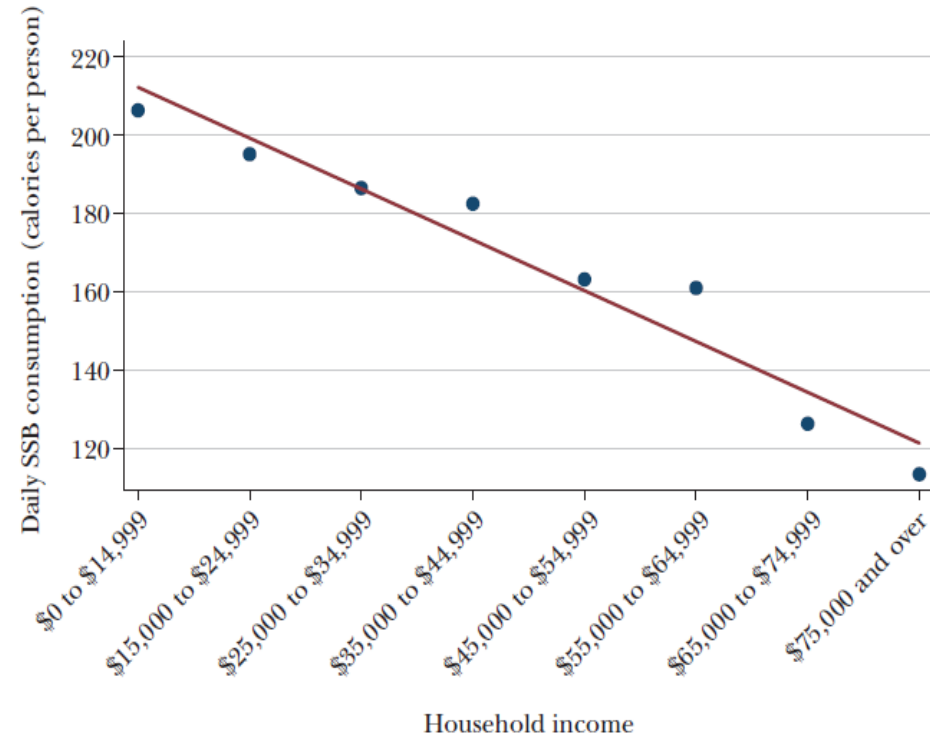
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# Review of Relevant Prior Literature

- Price elasticity of demand is close to -1.
  - ✓ 1% increase in price => a 1% decrease in demand for sugary beverages
    - Prices rose by 30-34%
    - Demand fell by 31-46%
  - ✓ Why?
    - Philadelphia's spatial size
    - Proximity of most poor to Center City

Figure credit:  
Alcott, Lockwood, & Taubinsky (2019)



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# Relevant Literature (continued)

- Tax Pass-Through
  - ✓ Tax is on distributors, not retailers
    - Do distributors pass costs on to retailers? Yes!
  - ✓ Suggest 100% of it is passed on to customers
  - ✓ A poorer group due to consumption and inability to purchase outside of Philly
- Childcare and Labor Supply
  - ✓ US welfare dependency down 28 pp when childcare 50% subsidized
  - ✓ Some roughly similar studies in the Netherlands and Oklahoma.
    - Both study private and public daycare
    - Oklahoma had no operating program



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# Why CGE as the Approach?

- Better, *fuller* perspective than with econometrics
- Enables a better *prospective* view (labor supply issue)
- Heavily used for regulatory policy (used in childcare funding analyses)
  
- We use GAMS software



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# The SAM for Philly

	Productivity Sectors (22)	Primary Factors (2)	Institutions (8)	Taxes (5)	Gross Capital Formation (1)	Change in industry Stocks (1)	Savings (1)	Foreign Sector (2)
Productive Sectors	Intermediate matrix		Public and private consumption		Investment and Stocks variation			Exports /Outflow
Primary factors	Labor and capital income							Adjustments for residence
Institutions		Labor and capital income	Transfers among institutions	Redistribution of tax revenues among the institutional Sectors				
Taxes	Taxes on production, wage tax, property tax and beverage tax		Income taxes and subsidies payments					Adjustments for residence
Gross Capital Formation							Redistribution of savings	
Change in industry Stocks							Redistribution of savings	
Savings			Public and private savings					Foreign savings
Foreign Sector	Imports /Inflow						Redistribution of savings	



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# The 2016 SAM for Philadelphia: Data Resources

- Based on R/ECON's 405-sector input-output accounts for the City
- Aggregated to 22 industries for modeling convenience
- Keep detail for
  - ✓ Grocery and related products wholesalers
  - ✓ Food and beverage stores
  - ✓ Food services
  - ✓ Trucking
  - ✓ Child day care services sector
- Household spending for four groups w/ aggregate income shares:
  - ✓ < 50% of poverty = 0.7%
  - ✓ Between 50% and 100% of poverty = 3.2%
  - ✓ Between 100 and 200% of poverty = 9.7%
  - ✓ Above 200% of poverty = 86.4%
- Local Taxes: wage tax, property tax, beverage tax and other local tax



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# Philadelphia's Economy in 2016

Sector #	Description	Baseline		
		GDP (\$000)	Labor Income (\$000)	Jobs
1	AGRICULTURE, FORESTRY, FISHING, AND HUNTING PLUS MINING	\$ 12,865	\$ 10,999	758
2	UTILITIES	315,658	264,247	1,895
3	CONSTRUCTION	2,306,836	1,128,741	22,182
4	DURABLE GOODS	1,030,057	667,407	9,613
5	NONDURABLE GOODS	3,288,648	991,973	12,561
6	WHOLESALE TRADE	2,284,414	1,115,142	12,854
7	GROCERY AND RELATED PRODUCT WHOLESALERS	437,896	268,193	4,478
8	RETAIL TRADE	1,988,537	1,287,519	42,131
9	FOOD AND BEVERAGE STORES	539,304	394,557	16,030
10	OTHER TRANSPORTATION AND WAREHOUSING	3,092,810	1,860,605	43,070
11	TRUCK TRANSPORTATION	84,000	61,778	2,151
12	INFORMATION	24,201,747	1,460,278	13,732
13	FINANCE, INSURANCE, REAL ESTATE AND RENTAL AND LEASING	23,250,067	5,430,932	75,321
14	PROFESSIONAL AND BUSINESS SERVICES	15,281,454	10,055,325	120,520
15	EDUCATIONAL SERVICES	7,252,391	5,963,009	88,325
16	OTHER HEALTH CARE AND SOCIAL ASSISTANCE	11,157,729	9,861,619	160,458
17	CHILD DAYCARE SERVICES	237,235	169,191	7,694
18	ARTS, ENTERTAINMENT, AND RECREATION	2,177,333	1,070,766	22,639
19	ACCOMMODATION	683,070	382,968	8,099
20	FOOD SERVICES	1,992,531	1,377,817	55,173
21	OTHER SERVICES, EXCEPT GOVERNMENT	1,541,608	1,604,979	48,897
22	GOVERNMENT	12,789,950	10,382,662	108,565
<b>TOTAL</b>		<b>\$115,946,140</b>	<b>\$55,810,707</b>	<b>877,146</b>

Other Local Tax      Wage Tax      Property Tax  
 \$ 1,402,100      \$ 1,840,807      \$ 571,485



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# Three Scenarios that Differ on Labor Supply

## Scenario 1:

- Use 2019 revenues from beverage tax—\$76.9 million
- Allocate 35.5% to PHLpre-K, the rest to general fund

## Scenario 2:

- Same as Scenario 1
- Increase labor supply by 0.2% (1,750 jobs)

## Scenario 3:

- Same as Scenario 1
- Increase labor supply by 0.5% (4,400 jobs)



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# Scenario 1: Economic Impacts of the Beverage Tax and Its Redistribution (Only)

Sector #	Description	Scenario 1		
		GDP (\$000)	Labor Income (\$000)	Jobs
1	AGRICULTURE, FORESTRY, FISHING, AND HUNTING PLUS MINING	5	5	0
2	UTILITIES	(172)	(144)	(1)
3	CONSTRUCTION	283	124	2
4	DURABLE GOODS	923	596	9
5	NONDURABLE GOODS	(1,120)	(330)	(4)
6	WHOLESALE TRADE	(651)	(305)	(4)
7	GROCERY AND RELATED PRODUCT WHOLESALERS	51,685	(13,134)	(219)
8	RETAIL TRADE	98	68	2
9	FOOD AND BEVERAGE STORES	162	121	5
10	OTHER TRANSPORTATION AND WAREHOUSING	(864)	(509)	(12)
11	TRUCK TRANSPORTATION	(93)	(69)	(2)
12	INFORMATION	3,547	201	2
13	FINANCE, INSURANCE, REAL ESTATE AND RENTAL AND LEASING	(422)	(128)	(2)
14	PROFESSIONAL AND BUSINESS SERVICES	(5,605)	(3,713)	(45)
15	EDUCATIONAL SERVICES	2,976	2,448	36
16	OTHER HEALTH CARE AND SOCIAL ASSISTANCE	4,325	3,813	62
17	CHILD DAYCARE SERVICES	9,653	6,886	313
18	ARTS, ENTERTAINMENT, AND RECREATION	175	88	2
19	ACCOMMODATION	264	155	3
20	FOOD SERVICES	896	642	26
21	OTHER SERVICES, EXCEPT GOVERNMENT	397	409	12
22	GOVERNMENT	3,426	2,779	29
<b>TOTAL</b>		<b>\$69,888</b>	<b>-</b>	<b>216</b>

Other Local Tax (\$733)    Wage Tax (\$5)    Property Tax (\$7)



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# Scenario 2: The Beverage Tax plus a Labor Supply Rise of 0.2%

Other Local Tax      Wage Tax      Property Tax  
 (\$17)                      \$2,177                      \$595



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Sector #	Description	Scenario 2		
		GDP (\$000)	Labor Income (\$000)	Jobs
1	AGRICULTURE, FORESTRY, FISHING, AND HUNTING PLUS MINING	10	8	1
2	UTILITIES	37	36	0
3	CONSTRUCTION	1,059	693	14
4	DURABLE GOODS	1,451	967	14
5	NONDURABLE GOODS	462	209	3
6	WHOLESALE TRADE	490	308	4
7	GROCERY AND RELATED PRODUCT WHOLESALERS	51,948	(12,986)	(217)
8	RETAIL TRADE	1,824	1,228	40
9	FOOD AND BEVERAGE STORES	593	447	18
10	OTHER TRANSPORTATION AND WAREHOUSING	303	391	9
11	TRUCK TRANSPORTATION	(37)	(22)	(1)
12	INFORMATION	14,507	1,035	10
13	FINANCE, INSURANCE, REAL ESTATE AND RENTAL AND LEASING	16,455	4,318	60
14	PROFESSIONAL AND BUSINESS SERVICES	(548)	15	0
15	EDUCATIONAL SERVICES	5,242	4,434	66
16	OTHER HEALTH CARE AND SOCIAL ASSISTANCE	7,490	6,752	110
17	CHILD DAYCARE SERVICES	15,409	10,996	500
18	ARTS, ENTERTAINMENT, AND RECREATION	899	501	11
19	ACCOMMODATION	487	295	6
20	FOOD SERVICES	2,244	1,616	65
21	OTHER SERVICES, EXCEPT GOVERNMENT	1,046	1,084	33
22	GOVERNMENT	6,886	5,806	61
<b>TOTAL</b>		<b>128,256</b>	<b>28,134</b>	<b>805</b>

# Scenario 3: Beverage Tax plus a Labor Supply Rise of 0.5%

Sector #	Description	Scenario 3		
		GDP (\$000)	Labor Income (\$000)	Jobs
1	AGRICULTURE, FORESTRY, FISHING, AND HUNTING PLUS MINING	15	12	1
2	UTILITIES	301	263	2
3	CONSTRUCTION	2,039	1,412	28
4	DURABLE GOODS	2,104	1,426	21
5	NONDURABLE GOODS	2,454	887	11
6	WHOLESALE TRADE	2,030	1,132	13
7	GROCERY AND RELATED PRODUCT WHOLESALERS	52,277	(12,800)	(214)
8	RETAIL TRADE	4,322	2,901	95
9	FOOD AND BEVERAGE STORES	1,214	914	37
10	OTHER TRANSPORTATION AND WAREHOUSING	1,793	1,536	36
11	TRUCK TRANSPORTATION	39	40	1
12	INFORMATION	28,473	2,096	20
13	FINANCE, INSURANCE, REAL ESTATE AND RENTAL AND LEASING	39,297	10,289	143
14	PROFESSIONAL AND BUSINESS SERVICES	5,931	4,783	57
15	EDUCATIONAL SERVICES	8,280	7,085	105
16	OTHER HEALTH CARE AND SOCIAL ASSISTANCE	11,610	10,571	172
17	CHILD DAYCARE SERVICES	15,652	11,177	508
18	ARTS, ENTERTAINMENT, AND RECREATION	1,842	1,037	22
19	ACCOMMODATION	769	473	10
20	FOOD SERVICES	4,110	2,959	118
21	OTHER SERVICES, EXCEPT GOVERNMENT	1,892	1,963	60
22	GOVERNMENT	11,353	9,706	101
<b>TOTAL</b>		<b>197,797</b>	<b>59,862</b>	<b>1,347</b>

Other Local Tax	Wage Tax	Property Tax
917	5,436	1,454



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# Conclusions

- If PHLpre-K does not improve labor supply, Philly's economy suffers negligibly
- Most any labor-supply improvement tilts toward a positive balance, although beverage distributors and related logistics suffer somewhat



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# Study weaknesses & Follow ups

- Elaborate labor income to households by income class
  - ✓ Would reveal further economic benefits remitted to lower-income groups
- Test sensitivity of results to
  - ✓ The price elasticity of sugary beverage demand
  - ✓ Of price pass-through to consumers
  - ✓ Generally not important though
- Evidence on improved health of Philadelphians due to reduced sugary beverage in-take?
- Evidence of improved health & educational outcomes on poor children due to engaging in early childhood education?



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