

# How Does the Earned Income Tax Credit Work? Exploring the Role of Commuting and Personal Transportation

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# Motivation

## Policy importance

- Largest anti-poverty cash-transfer program in the U.S.: \$64B to 31M families in 2022

## Empirics

- EITC is extensively studied but little focus on [mechanisms](#)

## Theory

- How to understand the EITC's positive labor supply effects under [imperfect competition](#)

# Overview

This paper...

- hypothesizes that EITC works (in part) by helping households purchase and maintain cars
- advances simulated instrument approach to account for regional heterogeneity in exposure to EITC increases
- finds empirical support for the hypothesized mechanism
- describes a simple search model capable of capturing liquidity effects of EITC in a frictional labor market

# EITC Basics

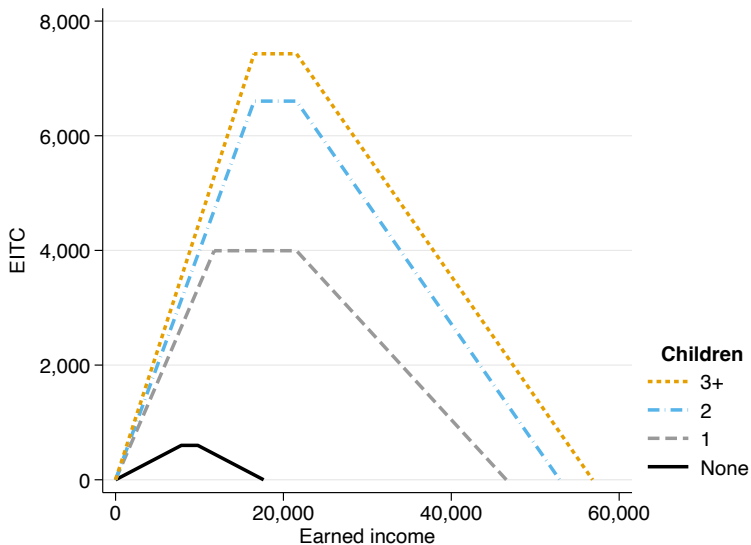
- Refundable tax credit for low-earning households
- Benefit size depends on earnings and number of children
- Most benefits received as cash during tax season after filing

## **Example**

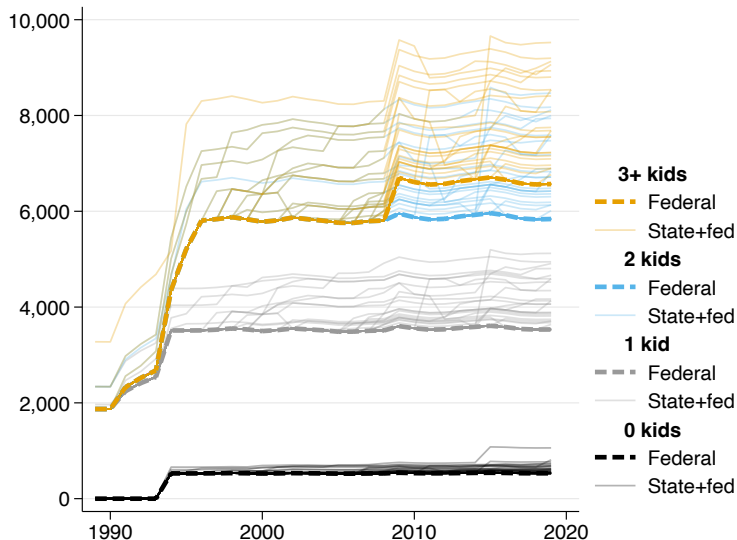
Single mother of 2 who earned \$19,200 in 2023 and files taxes ...

→ receives \$6,604 in early 2024

# EITC schedule 2023, single filer



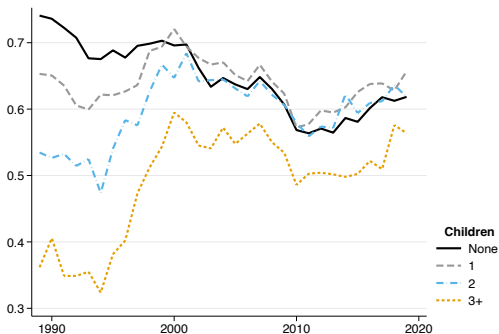
# Maximum EITC benefits over time (\$2020)



# The EITC consensus

“There is an **overwhelming consensus** in the literature that the EITC raises single mothers’ labor force participation” (Nichols and Rothstein, 2016)

Employment rate



IPUMS March CPS, 1989–2020, unmarried women 20–50 with high school degree or less

# EITC and labor supply: Neoclassical theory

- Encourages employment purely through expectation of higher income
- Assumes highly detailed EITC program knowledge in target population — contradicted in surveys
- Implicitly suggests EITC brings workers “off the sidelines”



# EITC and labor supply with search frictions

- Key monopsony observation: higher wages  $\Rightarrow$  fewer separations
- EITC helps cushion against shocks workers face on the job (child care, transportation, health, etc)
- EITC has liquidity effect in addition to information channel

## **Institute for a Competitive Workforce (2007)**

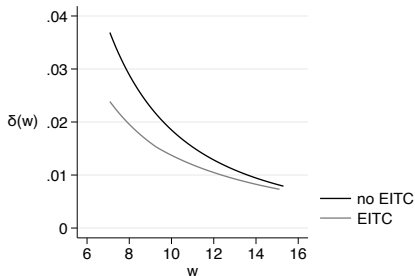
“...the credit helps workers to keep working and care for themselves at no cost to the business itself”

# EITC and labor supply with search frictions: Model

- Burdett-Mortensen where job destruction is function  $\delta(w)$  rather than the constant  $\delta$ 
  - Intuition: Job dissolution is falling in the (post-tax) wage  $w$
- Result: EITC can raise employment rate without *any* awareness of EITC
- Wage effects ambiguous due to two opposing forces
  - Firms can keep same headcount at a lower wage . . . . .  $E(w) \downarrow$
  - But workers don't fall off the job ladder as often . . . . .  $E(w) \uparrow$

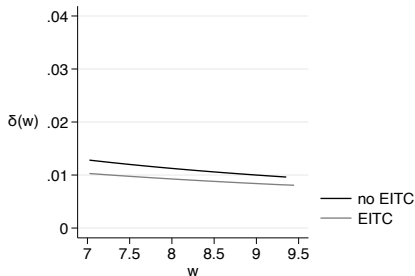
# Model simulation

## Scenario A



	No EITC	EITC
$E(\delta)$	0.01	0.0089
$u$	0.091	0.082
$\bar{w}$	15.3	15.1
$E(w)$	14.7	13.9

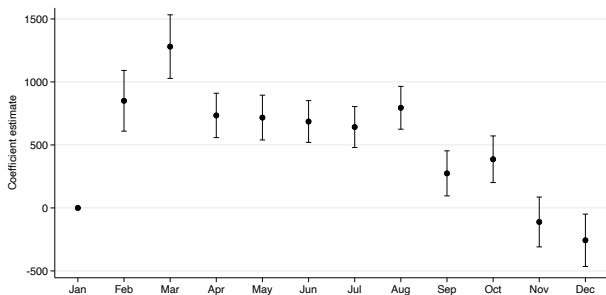
## Scenario B



	No EITC	EITC
$E(\delta)$	0.01	0.0086
$u$	0.095	0.078
$\bar{w}$	9.35	9.45
$E(w)$	8.63	8.73

# Mechanism: EITC and cars

- Surveys: Car purchase and maintenance a major use of EITC refunds
- 25% of recipients plan to spend on vehicles and 35% eventually do<sup>1</sup>
- Used car sales are highest in March due to tax refund checks



Note: Coefficient estimates associated with month indicators in a linear regression of nominal monthly retail used-car sales on the CPI used-car price index, year dummies, and month dummies, Jan. 1993–Dec. 2019. Robust standard errors.

<sup>1</sup>Romich and Weisner (2000) Smeeding, Phillips and O'Connor (2000), Mammen and Lawrence (2006), Mendenhall et al. (2012)

# Methodology

- Standard econometric approach: leverage variation over time and between households in EITC generosity
- To test mechanism, compare effects for areas with high/low access to public transportation
- Data and sample: CPS ASEC, 1989–2004. Unmarried women ages 20-50 with educational attainment of high school or less.

$$Y_{ijst} = \beta_0 + \beta_1 SimEITC_{ijs,t-1} + \beta_2 SimEITC_{ijs,t-1} \times Comm_j \\ + \beta_3 X_{ist} + \gamma_{js} + \gamma_t + \varepsilon_{ijst}$$

...for individual  $i$ , metro area  $j$ , state  $s$ , year  $t$

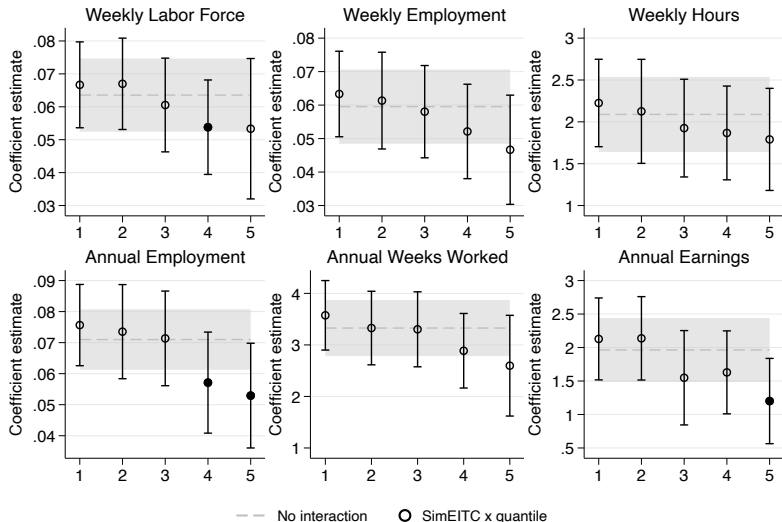
# Simulated instrument

- Motivation: Create variable capturing “effective” EITC received *without* using outcomes endogenous to EITC
- 1990 Census 5% sample — project future incomes and compute hypothetical EITCs
- *SimEITC* captures regional variation in EITC receipt and policy variation over time (state + federal)

# EITC effects by local commuting characteristics

	LFP (Weekly) (1)	Employed (Weekly) (2)	Hours (Weekly) (3)	Employed (Annual) (4)	Weeks (Annual) (5)	Earnings (Annual) (6)
A: High Public Transit						
SimEITC	0.0653*** (0.006)	0.0614*** (0.006)	2.127*** (0.240)	0.0742*** (0.006)	3.448*** (0.290)	2.078*** (0.268)
SimEITC × high public	-0.0121 (0.007)	-0.0127* (0.006)	-0.262 (0.215)	-0.0211** (0.007)	-0.789* (0.326)	-0.752** (0.228)
B: High Auto						
SimEITC	0.0590*** (0.006)	0.0555*** (0.006)	1.953*** (0.220)	0.0662*** (0.005)	3.142*** (0.284)	1.889*** (0.237)
SimEITC × high auto	0.0131** (0.005)	0.0116* (0.005)	0.391 (0.220)	0.0141** (0.005)	0.545 (0.286)	0.217 (0.255)
Observations	108,972	108,972	108,972	105,138	105,138	105,138
Standard errors in parentheses		* $p < 0.05$ , ** $p < 0.01$ , *** $p < 0.001$				

# EITC by quintiles of local public transit



▸ By auto quintiles   ▸ By public deciles   ▸ By auto deciles

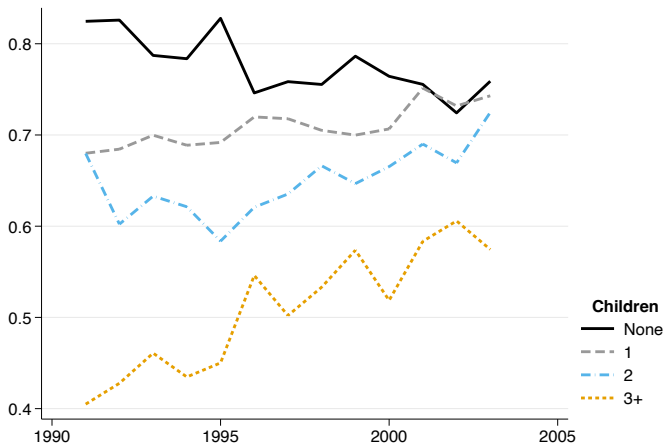


# Sensitivity

Main results are robust to a range of different specifications

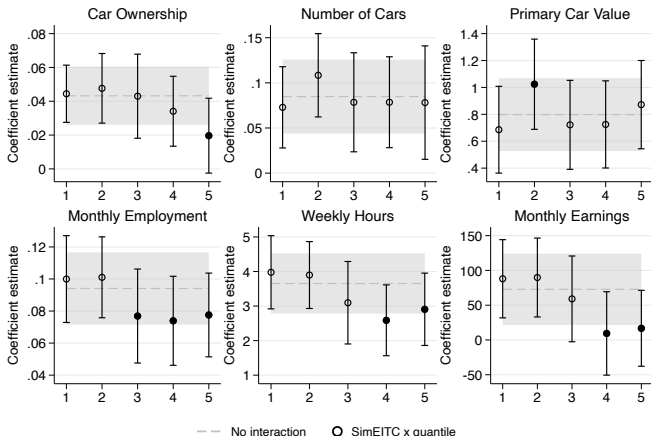
- Exclude welfare waiver states
- Restrict to pre-1996
- No-waiver, pre-1996
- Using MaxEITC in place of SimEITC
- Marital status interactions
- Age-of-youngest interactions
- Placebo (college-educated)
- Alternate commuting indicator interactions
- Alternate data set (SIPP)

# Validation: EITC and car ownership trends



Note: SIPP panels 1990–2001. Sample limited to unmarried women ages 20–50 with educational attainment of a high school degree or less. Car ownership measured at the household level.

# Validation: EITC and car ownership by quintiles of local public transit



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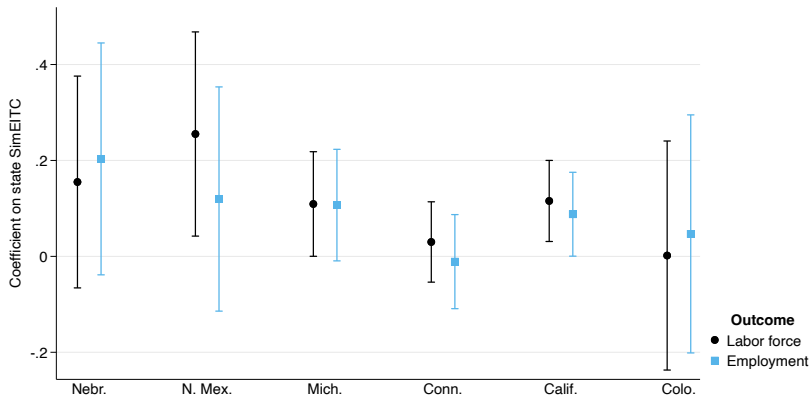
▸ By auto quintiles

# Additional analysis: 2009 expansion

	LFP (Weekly) (1)	Employed (Weekly) (2)	Hours (Weekly) (3)	LFP (Weekly) (4)	Employed (Weekly) (5)	Hours (Weekly) (6)
	Sample: 0+ children			Sample: 1+ children		
	A: High Public Transit					
SimEITC	0.0210** (0.007)	0.0255** (0.008)	1.217*** (0.298)	0.00824 (0.009)	0.00932 (0.010)	0.730 (0.383)
SimEITC × high public	-0.00256 (0.003)	-0.00285 (0.003)	-0.0776 (0.093)	-0.0112* (0.005)	-0.00977 (0.006)	-0.331 (0.213)
	B: High Auto					
SimEITC	0.0155* (0.006)	0.0204** (0.008)	1.043*** (0.286)	0.00289 (0.009)	0.00435 (0.010)	0.599 (0.389)
SimEITC × high auto	0.00644** (0.002)	0.00643** (0.002)	0.201* (0.094)	0.0128* (0.006)	0.0120* (0.006)	0.308 (0.218)
<i>Sum of coefficients</i>						
SimEITC + EITC × high auto	0.0219*** (0.006)	0.0268*** (0.008)	1.243*** (0.289)	0.0157 (0.010)	0.0164 (0.011)	0.906* (0.411)
Observations	1,011,748	1,011,748	1,011,748	457,026	457,026	457,026
Standard errors in parentheses		* $p < 0.05$ , ** $p < 0.01$ , *** $p < 0.001$				

# Additional analysis: State expansions

Strategy: Restrict analysis to individual states, using large implementations of state EITCs 2000+

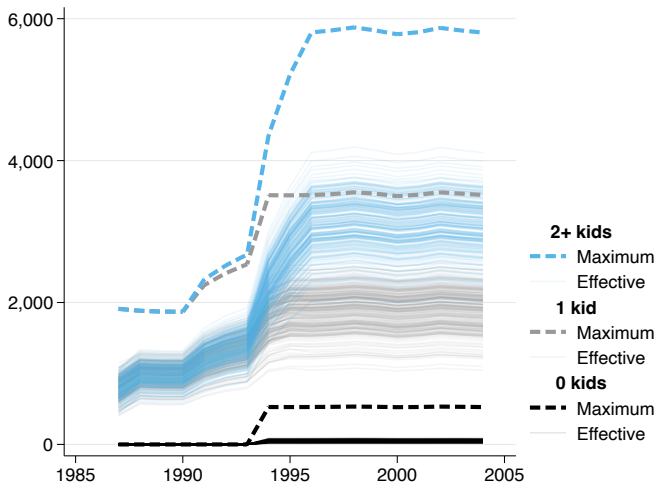


# Conclusion

- The EITC appears to work in part through the **liquidity** it provides, which supports car ownership
  - Employment ↑
  - Car ownership ↑
  - Heterogeneity: Effect in high-car areas > effect in low-car areas
- Examining the EITC through a model that features **shocks and frictions**
- Important to consider **regional heterogeneity** in wages and other factors when examining the impact of the EITC

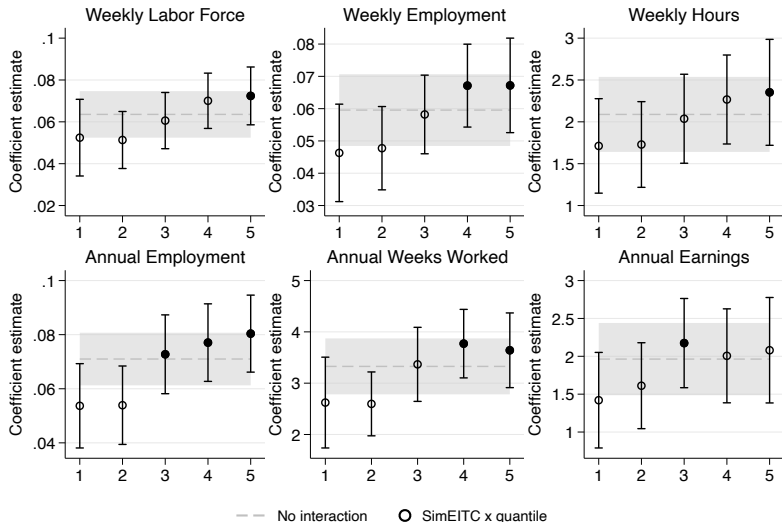


# Regional variation in *SimEITC*

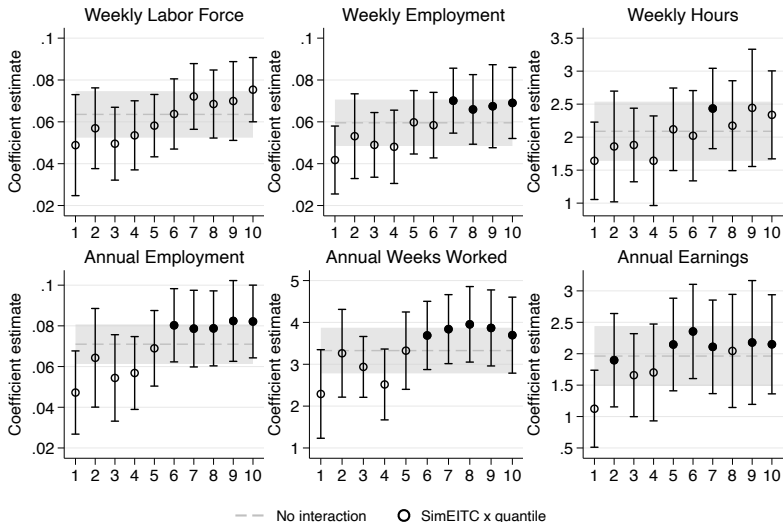




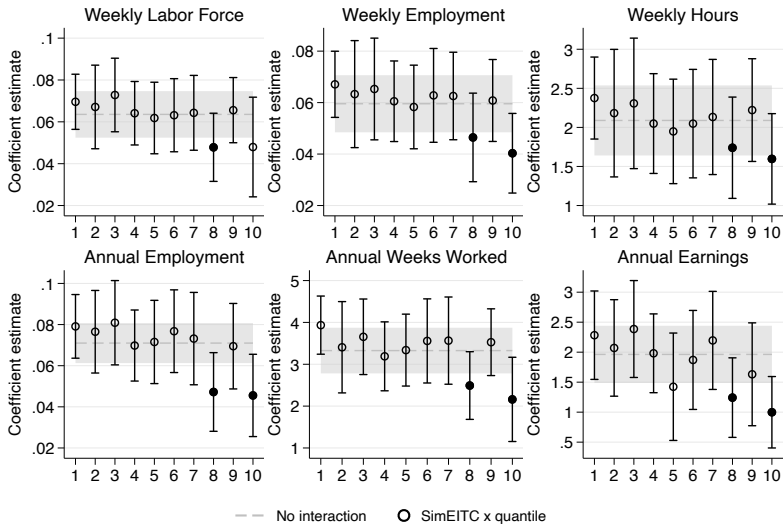
# EITC by quintiles of local auto dependence



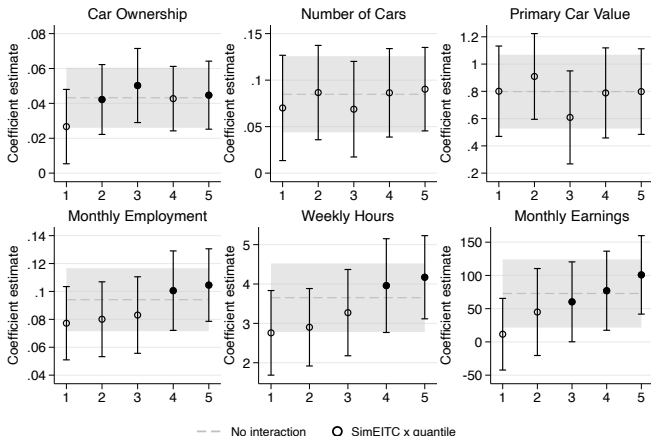
# By deciles of local auto dependence



# By deciles of local public transit



# Validation: EITC and car ownership by quintiles of local auto dependence



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