

Cash on Hand and Demand for Credit

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Motivation

- Prevalent use of short-term credit
 - \$41.2 billion on small dollar credit in 2012 (CFSI, 2012);
 - 15 million consumers use at least one small dollar credit product in 2012 (payday loans, pawn shop, auto title loans, installment loans and deposit advance).
 - High cost: \$100 fees on a two-week \$500 loan;
 - Possibly leads to repeat usage and mounting debt.

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 - \$41.2 billion on small dollar credit in 2012 (CFSI, 2012);
 - 15 million consumers use at least one small dollar credit product in 2012 (payday loans, pawn shop, auto title loans, installment loans and deposit advance).
 - High cost: \$100 fees on a two-week \$500 loan;
 - Possibly leads to repeat usage and mounting debt.
- Financial needs of subprime borrowers
 - Lack of savings and facing uncertainty in income;
 - Mismatch between income cycles and payment obligations.

Research Question

- Does the demand for small dollar credit respond to changes in income?
- Approach:
 - Income shocks come from cross-state variation in EITC benefits.
 - Study the impact of additional EITC benefits on the demand for small dollar credit.

Preview of Findings

- \$100 additional EITC benefits reduces
 - the total number of applicants by 6.6%;
 - the total number of loan applications by 8.3%;
 - the default rate by 1.5 pp (5.8%).
- The estimates imply that consumers could save at least \$10 on fees and charges with \$100 additional EITC benefits.
- The estimates imply an income elasticity of demand for credit around - 1.42.

Overview

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IV Estimates

Discussion and Conclusion

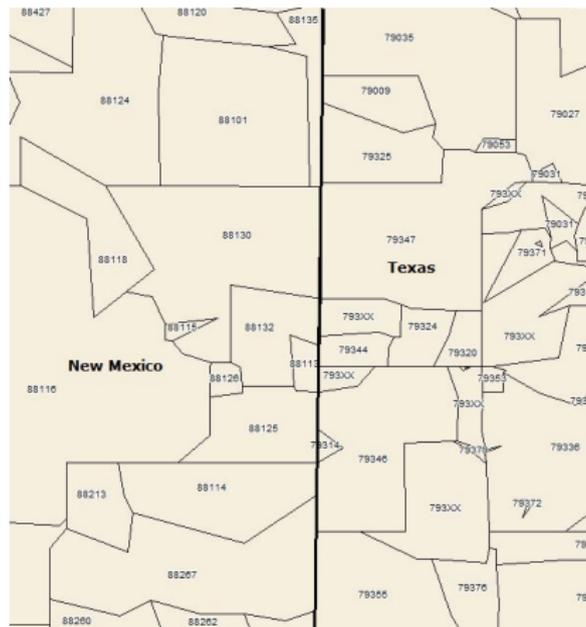
Related Literature

- Importance of liquidity
 - Bertrand and Morse, 2009; Evans and Moore, 2012; Gross and Tobacman, 2014; Gross, Notowidigdo and Wang, 2014; Gruber, 1997; Bertrand and Morse, 2009
- EITC benefits as income shocks
 - Lalumia, 2013; Manoli and Turner, 2014; Michelmore, 2013
- Effects of payday loans
 - Carrell and Zinman, 2008; Zinman, 2010; Melzer, 2011; Bhutta, Skiba and Tobacman, 2013

Identification

- Ordinary least squares estimation is problematic.
- Cross-state variations in state EITC top-up rates
 - Focus on ZIP5 areas within the same commuting zone that straddles state boundaries.
 - Using simulated EITC benefits to instrument for actual amount of EITC benefits received.

Identification: Example



Data

- Tax data: aggregated data on EITC returns and benefits at county or zipcode 5-digit (ZIP5) level from IRS and Brookings Institution;
- Loan level data in the small dollar credit market.
 - Applications and originated loans from *online* lenders (2010-2013) from a credit bureau.
 - Data coverage: 14 million unique applicants each year, which is roughly 4.4% of US population.
 - Online lenders make up about 1/3 of the market in loan volume.

Summary Statistics

Data on applications and loans from online lenders

Loans

Average \$ Loan Amount	\$446.90
Average \$ Loan Fees Per \$100	\$26.60
Average Duration of Loans (in days)	15.68

Borrowers

Median Age	40
Median Annual Income	\$30K
Average \$ Borrowed	\$587.35

Pay Frequency

Weekly	10%
Biweekly or Semi-monthly	74%
Monthly	16%

States Included for Analysis

- States which have refundable EITC and allow payday loans.



Measure of EITC Benefits

Simulated Instrument:

$$SimEITC_{st} = \frac{1}{I} \sum_{i \in I} \$EITC_{ist}(FilerStatus_{ist}, Income_{ist}, \#Dep_{ist})$$

- Take population from the CPS and run it through **federal** and **state** EITC schedules through *NBER TAXSIM*.
- $SimEITC_{st}$ is the average EITC benefits per recipient in state s in year t .
- $SimEITC_{st}$ measures the generosity of EITC benefits cross states, independent of any demographic or socioeconomic factors.

Federal EITC

State EITC

Regression Analysis

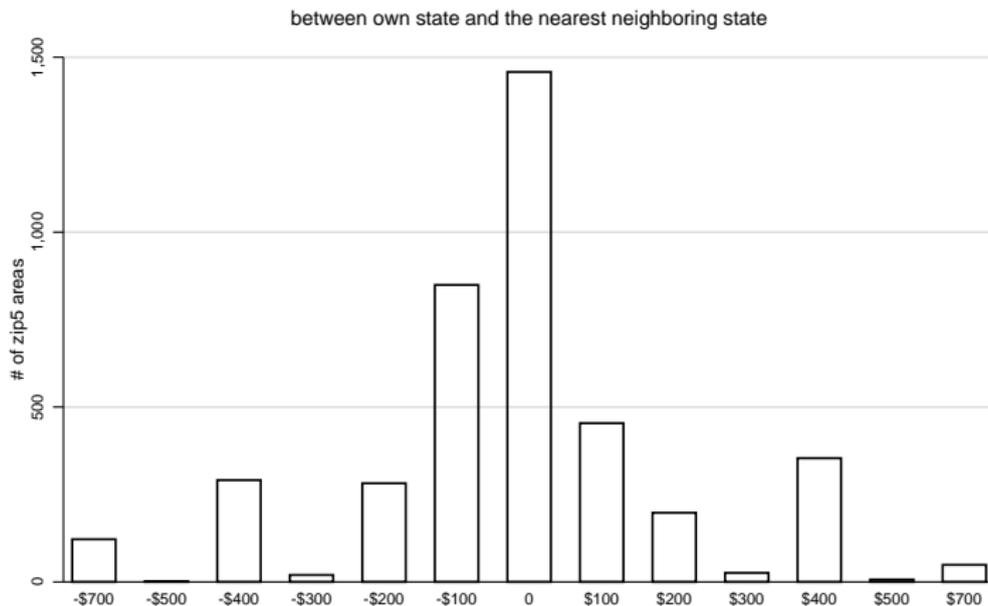
IV:

$$Y_{zt} = \beta \text{AvgEITC}_{zt} + \gamma_c + \theta_t + \alpha X_{zt} + \epsilon_{zt}$$

- ZIP5 areas belong to a commuting zone that straddles state borders;
- Control for commuting zone fixed effect (γ_c);
- Variation: generosity of state EITC benefits (instrumented using SimEITC_{st});
- Y_{zt} : total number of borrowers, total number of loans applications/loans originated, and total/average amount of loans in ZIP5 area z in year t .

Variations in Simulated IV

Differences in Simulated Average EITC Benefits Per Recipient



First Stage

The Effects of Simulated EITC on EITC Received (in \$100)				
Dep. Var.- Avg \$EITC Received				
	State level	10 miles	ZIP5 level 20 miles	all
Simulated Avg \$EITC	1.114*** (0.069)	1.079*** (0.097)	1.090*** (0.082)	0.992*** (0.037)
Mean of Dep. Var	23.39	22.45	22.44	22.40
N	108	6919	12772	67422
R Squared	0.86	0.38	0.37	0.39

Note: The table reports the estimates of the effects of the simulated average EITC benefits per recipient on the actual EITC benefits received across states or ZIP5 areas in a commuting zone that straddles state borders. The EITC benefits include both federal and state EITC. Federal EITC benefits received are from IRS tax returns data and state EITC benefits are calculated using the state EITC top-up rate, assuming full take-up among federal EITC filers. Regressions also include year FE and census region FE.

Check on Assumptions

Balance in Demographic and Socioeconomic Characteristics

Coefficient of Log of Simulated IV

Dependent Variable	Est.	Std. Err.	P-value	Mean of Dep. Var.
Male	-0.011	0.018	0.542	0.503
White	0.028	0.058	0.624	0.860
Median Age	2.004	3.855	0.605	40.719
High School Degree	-0.044	0.098	0.653	0.333
Bachelor Degree	0.072	0.12	0.548	0.218
In Labor Force	0.050	0.074	0.506	0.626
Log of Median Income	0.190	0.207	0.361	10.132
Below Poverty Line	-0.075	0.061	0.225	0.136
On Food Stamp	-0.021	0.022	0.347	0.035
Occupied Housing	0.032	0.077	0.682	0.853
House Ownership	0.089	0.052	0.090	0.739
Moved Last Year	0.005	0.018	0.808	0.025

Note: This table shows the coefficients of the simulated instrument, which measures the generosity of EITC at federal and state level, on the characteristics of ZIP5 areas. Data is from ACS 2008-2012 Summary File. Sample includes only ZIP5 areas in a commuting zone that spans state borders.

Results - Loan Applications

Effects of EITC on Loan Applications - IV Estimates				
	#Borrowers	ln(#Borrower)	#Loans	ln(#Loans)
Avg EITC (in \$100)	-4.330*** (1.629)	-0.066*** (0.016)	-7.956** (3.640)	-0.083*** (0.022)
Mean of Dep. Var.	81.85	2.99	127.49	3.36
N	6769	6769	6769	6769
Total Population	X	X	X	X
Income Distribution	X	X	X	X
CZ FE	X	X	X	X
Census Region FE	X	X	X	X
Year FE	X	X	X	X

Note: Data is at the year-ZIP5 level. This set of regression restricts to states that allow payday loans and state-licensed lenders. States with nonrefundable state EITC are excluded (OH, DE, ME and VA). Standard errors are clustered at the commuting zone level.

- If we increase EITC benefits by \$100, the number of borrowers decreases by 6.6% and the number of loans decreases by 8.3%.

Results - Originated Loans

Effects of EITC on Originated Loans - IV Estimates					
	#Borrowers	ln(#Borrower)	ln(\$Total Credit)	ln(\$Avg Credit)	Default Rate
Avg EITC (in \$100)	-1.955*** (0.749)	-0.074*** (0.023)	-0.062* (0.037)	0.024 (0.040)	-0.015*** (0.004)
Mean of Dep. Var.	13.329	1.913	8.102	6.488	0.263
N	2016	2016	2016	2016	2016
Total Population	X	X	X	X	X
Income Distributions	X	X	X	X	X
CZ FE	X	X	X	X	X
Census Region FE	X	X	X	X	X
Year FE	X	X	X	X	X

Note: Data is at the year-ZIP5 level. This set of regression restricts to states that allow payday loans and state-licensed lenders. States with nonrefundable state EITC are excluded (OH, DE, ME and VA). Standard errors are clustered at the commuting zone level.

- If we increase EITC benefits by \$100, the total credit borrowers decreases by 6.2% and the default rate of loans decreases by 1.5 percentage points.
- Given average loan amount of \$587.35, for each additional \$100 EITC, loan amount is reduced by \$36 ($=\587.35×0.062).

Robustness Checks

- Permutation test **results**;
- Strategic pricing (fees) in response to EITC benefits;
- Analysis at county level, instead of ZIP5;
- Controlling for state-level characteristics or number of storefront lending sites at ZIP5 level;
- Varying restrictions on distance to border;
- Varying restrictions on lenders, such as reporting period.

Discussion

- Savings of Financial Costs:
 - Loan amount is reduced by \$36 for an additional \$100 EITC benefits. Using an average fee of \$26 per \$100 loan, each individual would save \$10 on interest fee alone.
 - Adding the potential savings on late fees, the savings on financial costs would be larger.

- Income Elasticity for Credit:

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$$\epsilon = \frac{\Delta \$debt / \$total\ debt}{\Delta \$income / \$total\ income} = \frac{\Delta \$debt / \Delta \$income}{\$total\ debt / \$total\ income}$$

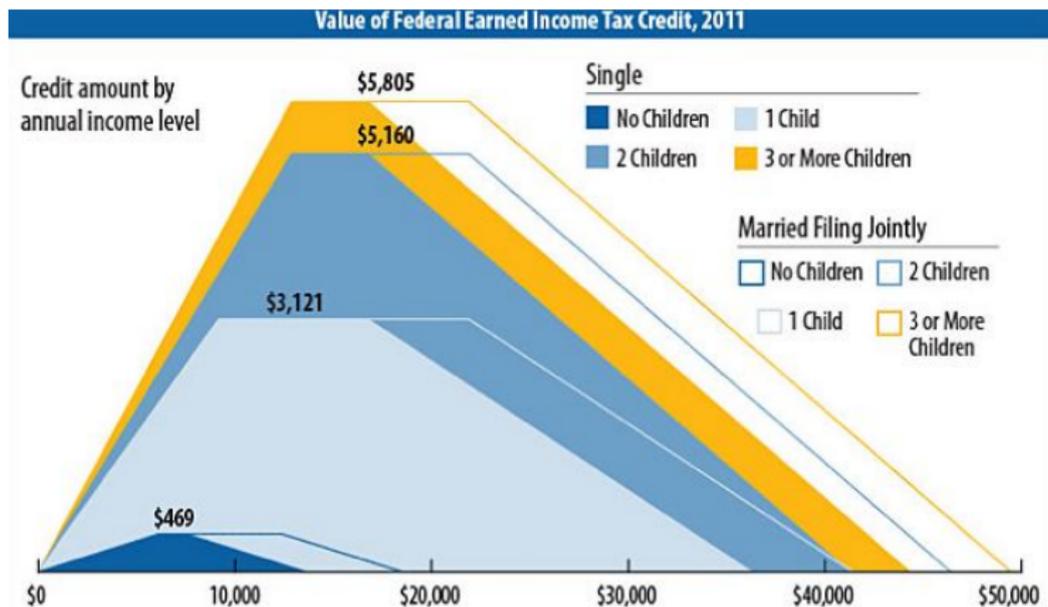
- Using a debt-to-income ratio of 25.42%, the income elasticity of demand for credit would be - 1.42 (=0.36/25.42%).

Conclusion

- This paper provides evidence on large reductions on demand for small dollar loans in response to \$100 EITC benefits.
 - the total number of applicants by 6.6%;
 - the total number of loan applications by 8.3%;
 - the default rate by 1.5 pp (5.8%).
- This paper highlights the additional benefits of EITC program on reducing the use of high-cost credit.
- It is important to consider the role of income in underwriting policy and regulations for the small dollar credit market.

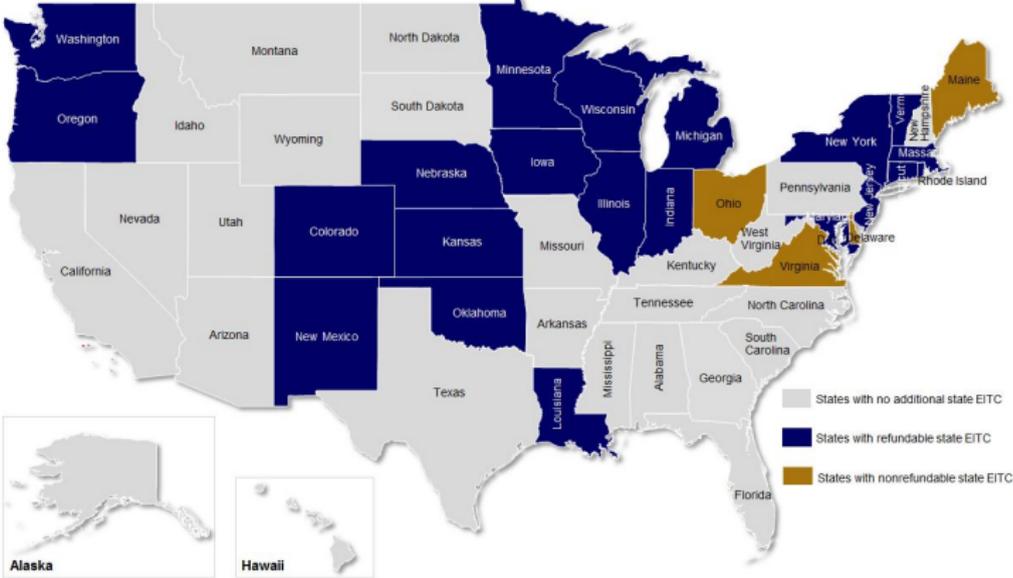
Extra Slides

Federal EITC Schedule



main slides

State EITC Top-up Rates



main slides

Check on Assumption

Balance in EITC Eligibility and Tax Filing				
Dependent Variable	Coefficient of Log of Simulated IV			
	Est.	Std. Err.	P-value	Mean of Dep. Var.
Eligible for EITC	0.011	0.061	0.857	0.199
Used Direct Deposit	-0.004	0.056	0.949	0.774
Used Paid Tax Prep	0.029	0.063	0.649	0.577
Used RAL or RAC	0.005	0.003	0.131	0.289

Note: This table shows the coefficients from the regression of the simulated instrument, which measures the generosity of EITC at federal and state level, on ZIP5 level outcomes, including fraction of the population being eligible for EITC, used direct deposit and used paid tax preparation services.

Check on Assumptions

Balance in State Regulations on Payday Loans				
Coefficient of Log of Simulated IV				
Dependent Variable	Est.	Std. Err.	P-value	Mean of Dep. Var.
Any Regulation on				
Loan Size	-0.797	0.636	0.220	0.094
Interest Rate	0.394	0.923	0.672	0.219
Rollover	-0.888	1.072	0.414	0.625
Min Loan Term	-0.440	1.035	0.673	0.688
Max Loan Term	0.498	0.869	0.571	0.188
Regulation on				
Loan Size (\$)	134.482	975.042	0.891	631.035
Interest Rate (APR)	-435.840	800.342	0.591	498.299
Min Loan Term (Days)	4.130	11.527	0.729	11.300
Max Loan Term (Days)	-0.641	41.975	0.988	39.000

Note: This table shows the coefficients from the regression of the simulated instrument, which measures the generosity of EITC at federal and state level, on state level regulations on small dollar credit products such as payday loans. Regulations are from National Conference of State Legislatures (NCSL).

Results - OLS

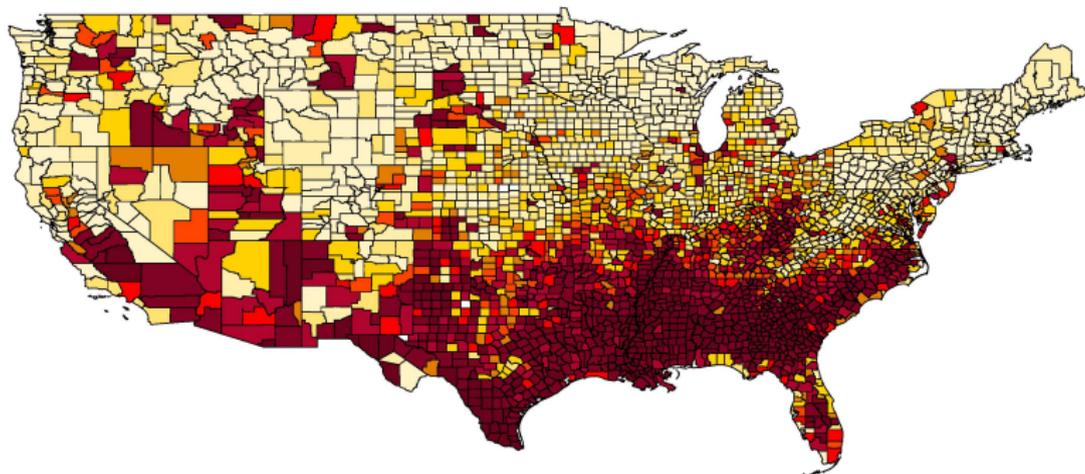
Effects of EITC on Loan Applications - OLS Estimates

	#Borrowers			ln(#Borrower)		
	10 miles	20 miles	all	10 miles	20 miles	all
Average EITC (in \$100)	1.527* (0.835)	3.872** (1.617)	2.815* (1.587)	0.027* (0.016)	0.035** (0.014)	0.034** (0.014)
Mean of Dep. Var.	109.56	107.52	82.05	3.21	3.17	2.99
N	1820	3247	6772	1820	3247	6772
Total Population	X	X	X	X	X	X
Income Distribution	X	X	X	X	X	X
CZ FE	X	X	X	X	X	X
Census Region FE	X	X	X	X	X	X
Year FE	X	X	X	X	X	X

Note: Data is at the year-ZIP5 level. EITC data in TY2010-TY2012 are from Brookings Institution. Number of borrowers is from small dollar loan applications. This set of regression restricts to states that allow payday loans and state-licensed lenders. States with nonrefundable state EITC are excluded (OH, DE, ME and VA). Standard errors are clustered at the commuting zone level.

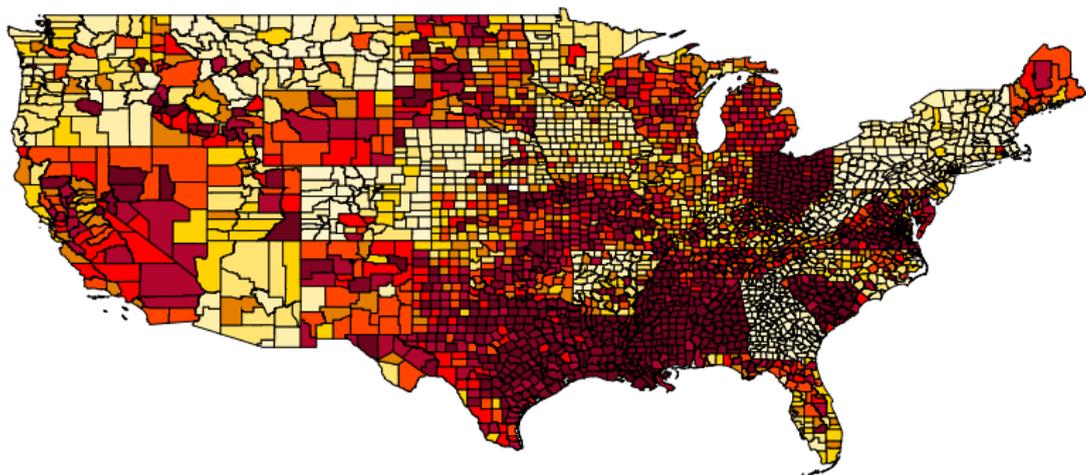
EITC Benefits TY2010

- \$EITC per recipient by deciles across counties



Borrowing CY2011

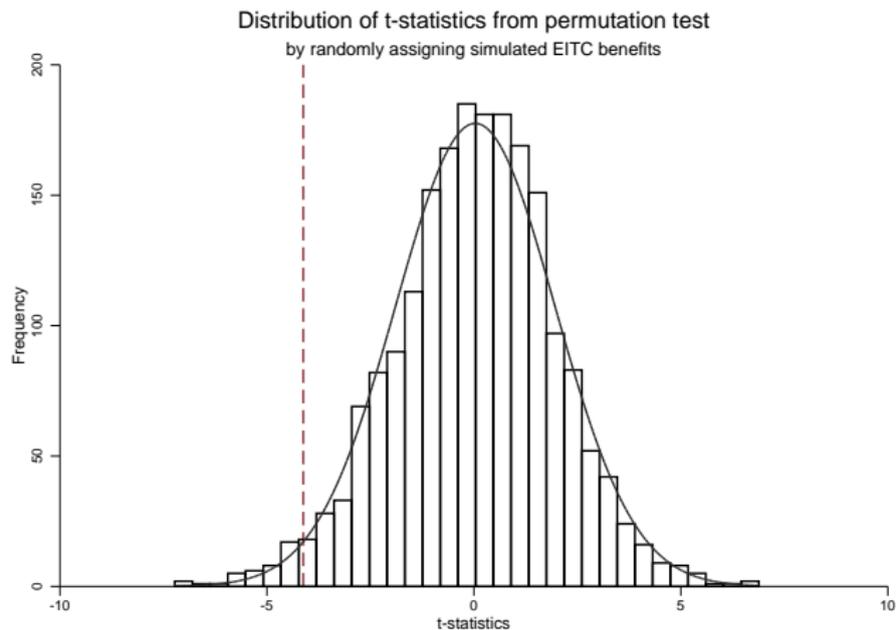
- %Borrower by deciles across counties



Permutation test

- Randomly assign the simulated EITC benefits to each state and run the same regressions.
- Repeat this 2,000 time and plot the distribution of t-statistics.

Permutation test



main slides