The Effect of Capital Gains Taxes on Business Creation and Employment: The Case of Opportunity Zones

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NBER Business Taxation in a Federal System
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Opportunity Zone (OZ) Program

- Part of the Tax Cuts and Jobs Act that was signed into law on December 22, 2017.
- Provides tax incentives for investing in specific Census tracts "to spur economic growth and job creation in low-income communities" (IRS).
- Census tracts eligible for the program were either low-income communities or contiguous to low-income communities. ▸ Details
- A governor of each state could designate up to 25% of eligible tracts as Opportunity Zones.

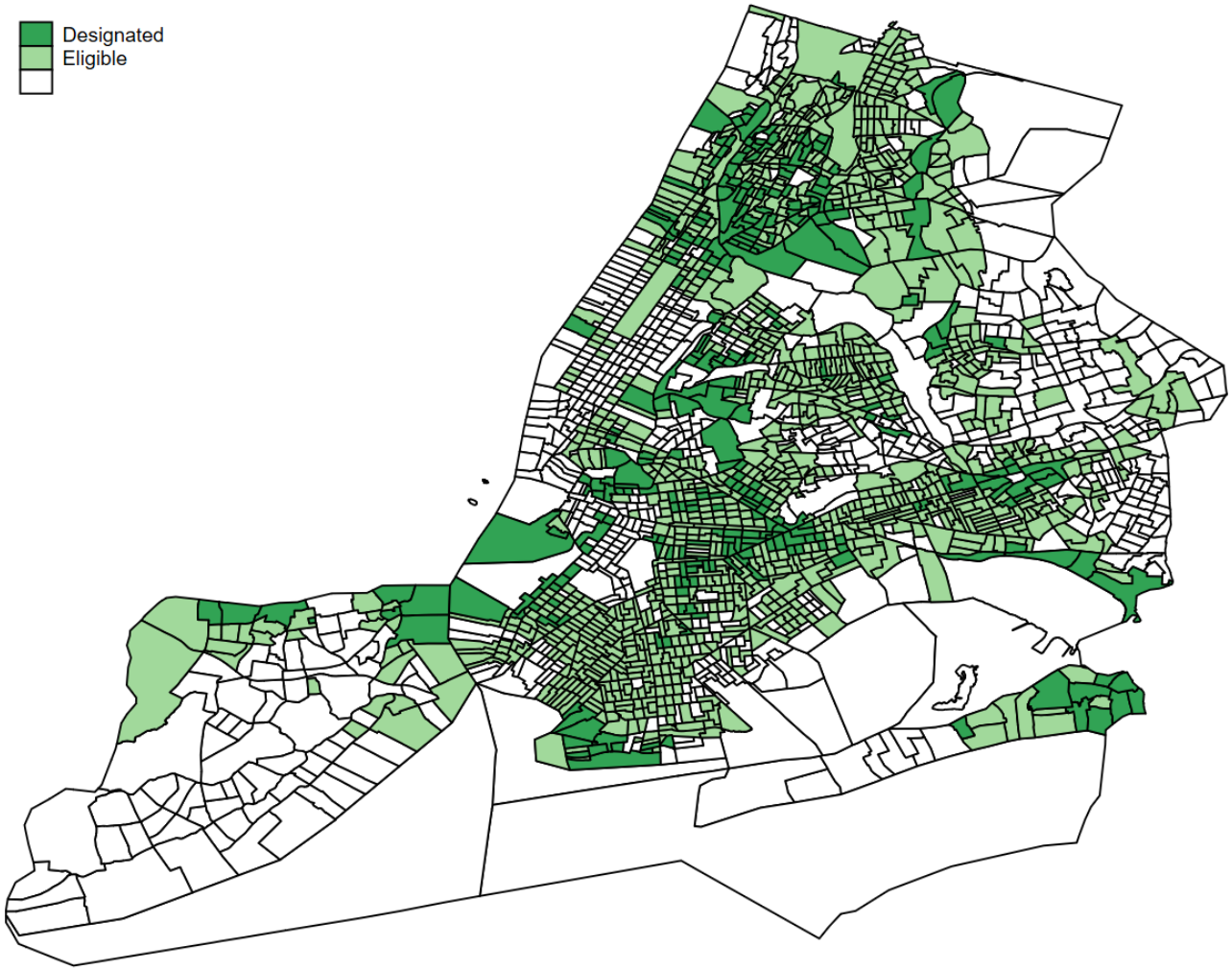
Did the policy affect its intended outcome – job growth?

Data and Strategy

- Your-economy Time Series (YTS) establishment-level panel data on employment in all U.S. public and private establishments: ▸ Summary Stats
  - Kunkle (2018): similar to the employment data in the Current Population Survey (CPS) from the US BLS.
  - Limitation: observe number of employees and number of establishments, but not where employees live.
- Difference-in-difference: for a eligible tract i and two-year period t regress the two-year growth $Y_{i,t}$ on post-2017 dummy P_t and designation dummy D_i and their interaction while controlling for the ACS tract controls X_i:

$$Y_{i,t} = \alpha_0 + \alpha_1 P_t + \alpha_2 D_i + \alpha_3 D_i P_t + \alpha_X X_i + \epsilon_{i,t},$$

Eligible Tracts in New York City



1,448 eligible tracts, out of which 306 were Designated (292 LIC).

▸ Zoom In

Limitations of the Empirical Strategy

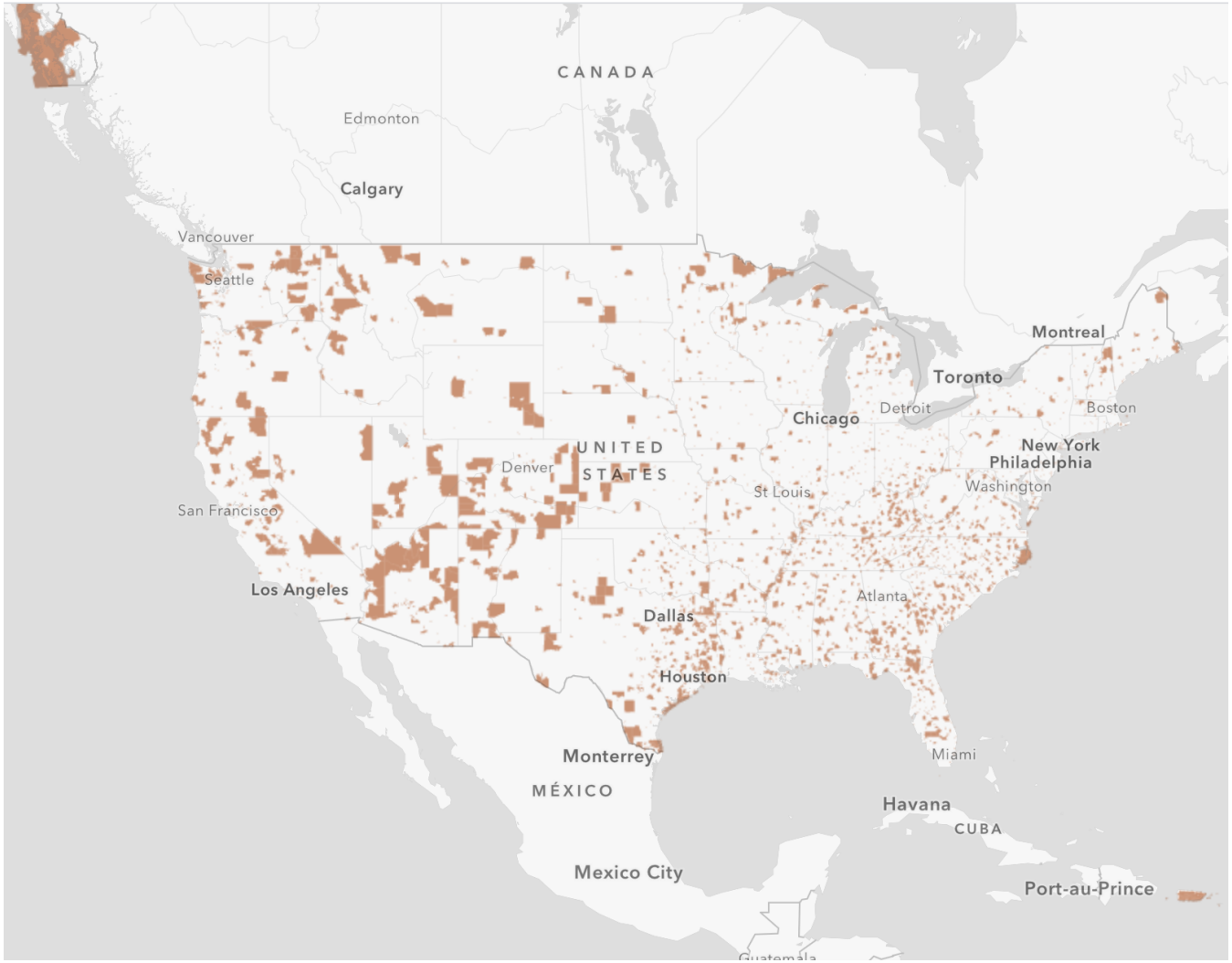
What we can not identify the effect of the tax law on

- the employment growth on aggregate,
- the employment growth in the metro area.

We can identify the effect of tax law on:

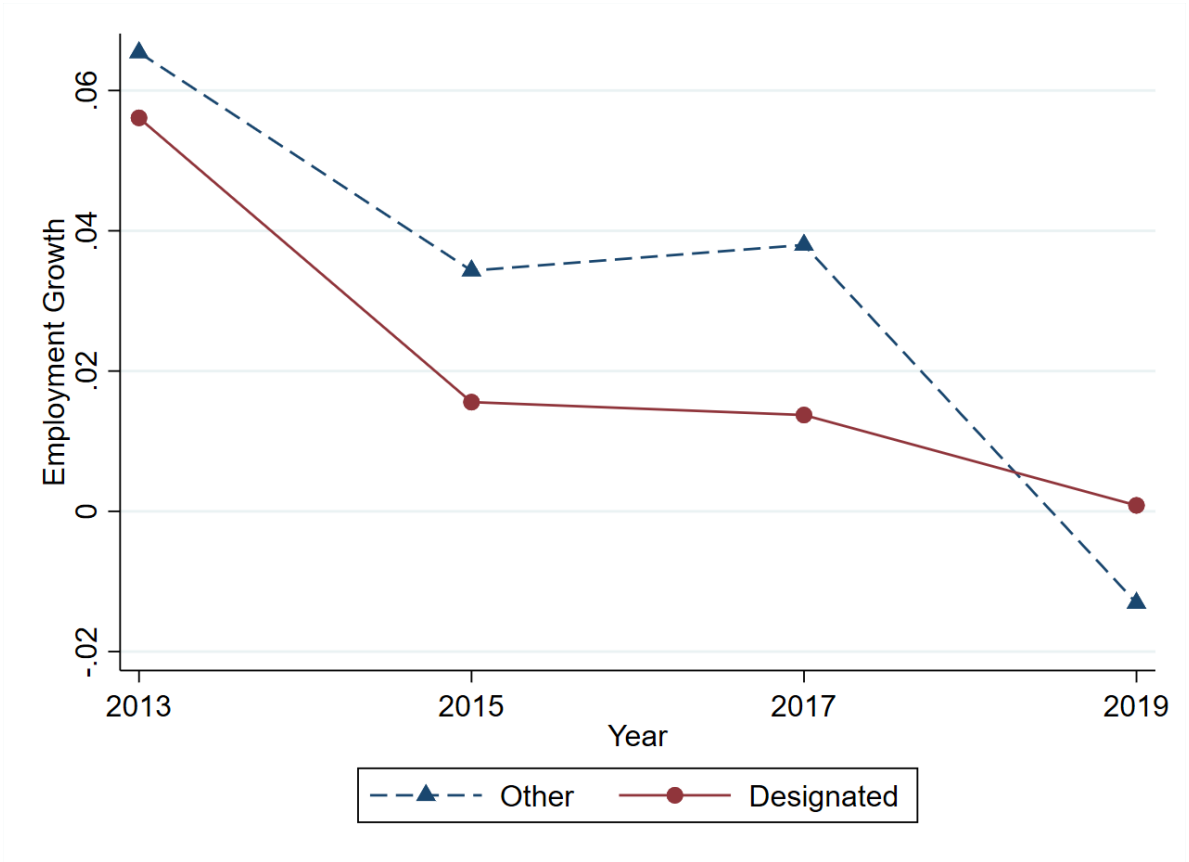
- the employment growth in Opportunity Zones,
- the employment growth in tracts nearby Opportunity Zones.

All Opportunity Zones



Source: Economic Innovation Group, https://eig.org/opportunityzones.

Pre-Trends: 2-Yr Employment Growth



Notes:

- "Other" are eligible, but not designated, tracts.
- The employment growth is winsorized at 1%. Winsorizing replaces the outliers – lowest 1% and highest 99% values – by the next value inwards.

▸ More Figures ▸ Predictions using Pre-Trends

Benchmark Results: Employment Growth Increased by 3-4.6 ppts in Urban Tracts

	Metropolitan Area		Non-Metropolitan Area	
	(1) LAV	(2) OLS Winsorized at 1%	(3) LAV	(4) OLS Winsorized at 1%
D_i	-0.014***	-0.019***	0.008	0.015
	(0.003)	(0.005)	(0.007)	(0.012)
P_t	-0.091***	-0.077***	-0.016***	0.044***
	(0.002)	(0.003)	(0.004)	(0.007)
$D_i P_t$	0.029***	0.046***	-0.012	-0.000
	(0.005)	(0.007)	(0.010)	(0.015)
$\text{Emp.Growth}_{2013-2015}$	-0.005	-0.005	0.021***	0.048***
	(0.004)	(0.006)	(0.007)	(0.011)
Observations	40,944	40,944	11,109	11,109
R^2		0.020		0.017

- LAV stands for quantile regression.
- Winsorized at 1%: Winsorizing replaces the outliers – lowest 1% and highest 99% values – by the next value inwards.
- All regressions include a full set of ACS controls.
- ***, **, and * indicate significance at the 1%, 5%, and 10% levels.

▸ Establishment Growth ▸ Without Urban/Rural

Robustness: Potential Selection Bias

- OZs were selected by the governors out of eligible tracts.
- Selection process varied by the state:
    1. Housing Authority made suggestions, then governors finalized.
    2. Tracts applied to be designed through a formal application process.
    3. Public opinion was solicited.
    4. Not disclosed.

We don't think the selection is a big concern for our results:

- Selection process was relatively quick: from January 2018 to March 2018 (main) with some extensions to June-July 2018.
- Eligible tracts are more homogenous than all U.S. tracts.
- Robustness checks.

Robustness: Potential Selection Bias

1. **Political affiliation:**
   - Eldar, Garber (2020), Frank, Hoopes, Lester (2022): if the tract's lower house representative's political party was the same as the governor's $\Rightarrow$ probability of the tract being selected as an OZ $\uparrow$ conditional on tract characteristics.
   - Inclusion of the triple interaction terms with their political affiliation variable shows **lower** employment growth for politically affiliated tracts.
2. **Low-income communities (LIC) vs tracts contiguous to LIC (non-LIC):** estimates are similar to the benchmark for LIC and are higher for non-LIC, but so are standard errors.
3. **Excluding tracts with top 5 or 10% of 2017-2019 employment growth in each state:** expectedly go down, but are still significant at 1.06-1.87 ppts.

▸ Tables

Robustness: Potential Selection Bias

4. **Controlling for observables using propensity score style estimator:**
   - Sant'Anna, Zhao (2020)'s Doubly Robust DiD Estimator: robust to misspecification of the propensity score or the main empirical model but not both.
   - Estimates are higher than the baseline: 5.3-5.4 ppts.
5. **Restricting the control group** to all eligible, but not designated, tracts within a 3-mile radius of a designated tract.
   - Estimates are higher at 4.0-6.4 ppts.
6. **State or Census Tract FEs:** results similar to the benchmark.

▸ Tables

Did OZs Just Reallocate Jobs from Nearby Tracts?

- Expand the sample beyond the eligible tracts to include:
  - tracts that are contiguous to eligible tracts, call these group 1,
  - tracts that are contiguous to group 1 tracts, – group 2,
  - tracts that are contiguous to group 2 tracts, – group 3,
  - tracts that are contiguous to group 3 tracts, – group 4.
- Interact group 1-4 dummies with the post and designation dummies to estimate the spillover effect.
- Ex: effect on contiguous tracts is identified by comparing
  - the tracts that are contiguous to designated tracts
  - the tracts that are contiguous to the eligible, but not designated, tracts.
- Result: positive spillovers of 2 ppts on group 1 and 2 tracts.

▸ Details

Heterogeneity

- **Old vs New Establishments:** Details
  - Positive significant effects only for new establishments.
  - Thus, creation of new establishments – extensive margin – is driving the employment growth.
- **By Industry:** Details
  - Biggest effects in construction and real estate industries, but effects significant if we exclude them.
  - Positive effects in tradable and other industries but not in non-tradables (restaurants and retail).
- **By Skill Level:** Details
  - Positive significant effect on industries with all skill levels.
  - Biggest effects in industries with "median" skill level (a few years of college).
- **By % of White:** Details Bigger effects with a $\uparrow$ minority %.

Evidence on the Effects of OZs: Big Picture

- **Private investment:**
  - Kennedy, Wheeler (2021): $18.9 billion of aggregate OZ investments from electronic files in the tax year 2019, and $41.5 billion of aggregate cumulative OZ investments by the tax year 2020.
  - Xu (2021): private investment increased but more in existing and older firms.
- **Employment:**
  - Arefeva, Davis, Ghent, Park (2021): positive employment growth in urban tracts.
  - Freedman, Neumark, Khanna (2021): no effect on residents.
  - Atkins, Hernandez-Lagos, Jara-Figueroa, Seamans (2020): no effect on job postings in zipcodes with many OZs.

Evidence on the Effects of OZs: Big Picture

- **Commercial real estate:**
  - Corinth Feldmand (2022): no effects for properties on the eligibility criteria border.
  - Wiley, Nguyen (2022): higher prices of industrial properties with high land share.
  - Sage, Langen, Van de Minne (2019): higher prices of land and older properties.
- **Residential real estate:**
  - Chen, Glaeser, Wessel (2021): no response of prices at the beginning with some effects in 2019.
  - Bekkerman, Cohen, Maiden, Mitrofanov (2021): use microdata, see 4-6% higher prices with no effect on sales.
  - Wheeler (2021): 18.2% increase in supply.

Conclusion

- Opportunity Zone legislation increased employment growth by 3.0 - 4.6 ppts in Census tracts located in metropolitan areas.
- Multiple robustness checks to mitigate selection concerns.
- The policy encouraged entry of new establishments.
- The effect of the policy was largest for construction.
- The effect was similar across skilled and unskilled industries.
- Positive spillovers to nearby tracts.

Appendix

Tax Advantages for Investment in OZs

1. If reinvest realized capital gains on existing assets, can
   - **Defer** federal taxes on capital gains until sale
   - **Reduce** federal taxes on capital gains by 10% (15%) if held for $\geq$ 5 (7) years
2. If make a new investment, can
   - **Eliminate** federal taxes on capital gains if held for $\geq$ 10 years

Back

Eligible Census Tracts Criteria

A census tract is eligible if it is

1. a "Low-Income Community" (LIC) if
   - The poverty rate $> 20\%$,
   - The median family income $>$ the median family income of the metro area or state.
2. or contiguous with a LIC (non-LIC) but still
   - does not have a median income exceeding 125% that of the LIC with which the tract is contiguous,
   - no more than 5% of designated tracts could be non-LIC.

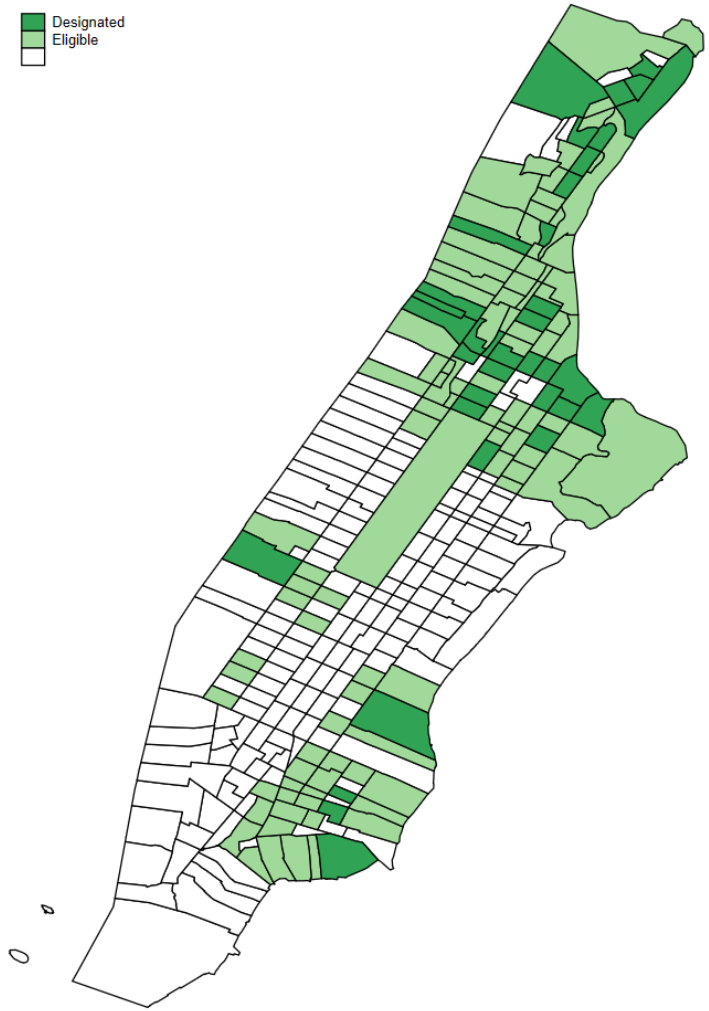
Back

Summary Stats: Eligible Tracts in 2017 by Designation

Variable	Mean	
	Eligible, but not OZs	Designated OZs
Designated	0	1
Your-economy Time Series data		
Employment	1912	3156
2-Yr employment growth	0.044	0.019
Number of establishments	186	269
2-Yr establishment growth	0.046	0.038
American Community Survey controls		
% White	0.680	0.574
% Higher ed	0.198	0.160
% Renters	0.432	0.552
% Share of native-born with health insurance	0.894	0.879
% Poverty	0.177	0.246
% Supplemental income	0.086	0.119
% Employed	0.303	0.268
Median earnings	28,087	24,386
Median household income	46,435	36,538
Median gross rent	915	826
Population	4208	4022
Total housing units	1550	1464
Average commuting time (min)	36.8	14.7

Back

Eligible Tracts in Manhattan



133 eligible tracts, out of which 36 were Designated (all 36 LIC)

▸ Back

Metropolitan versus non-Metropolitan Areas: Establishment Growth

	Metropolitan Area		Non-Metropolitan Area	
	(1) LAV	(2) OLS Winsorized at 1%	(3) LAV	(4) OLS Winsorized at 1%
D_i	-0.014***	-0.016***	0.016***	0.024***
	(0.003)	(0.003)	(0.006)	(0.007)
P_t	-0.117***	-0.140***	-0.015***	0.003
	(0.002)	(0.002)	(0.003)	(0.004)
$D_i P_t$	0.032***	0.043***	-0.022***	-0.023**
	(0.004)	(0.005)	(0.007)	(0.009)
$Emp.Growth_{2013-2015}$	0.010***	0.015***	0.045***	0.039***
	(0.004)	(0.004)	(0.005)	(0.007)
Observations	40,944	40,944	11,109	11,109
R^2		0.125		0.011

- LAV stands for quantile regression.
- Winsorized at 1%: Winsorizing replaces the outliers – lowest 1% and highest 99% values – by the next value inwards.
- ***, **, and * indicate significance at the 1%, 5%, and 10% levels.

Back

All Eligible Tracts: Employment Growth

	(1) OLS	(2) LAV	(3) OLS	(4) LAV	(5) OLS Winsorized at 1%
ACS Controls	No	No	Yes	Yes	Yes
D_i	-0.027*	-0.015***	-0.018	-0.009***	-0.012***
	(0.015)	(0.003)	(0.015)	(0.003)	(0.005)
P_t	0.001	-0.072***	-0.003	-0.074***	-0.050***
	(0.009)	(0.002)	(0.009)	(0.002)	(0.003)
$D_i P_t$	0.025	0.021***	0.028	0.021***	0.036***
	(0.022)	(0.004)	(0.021)	(0.004)	(0.006)
$Emp.Growth_{2013-2015}$			0.098***	-0.003	0.009*
			(0.017)	(0.004)	(0.005)
Observations	52,060	52,060	52,053	52,053	52,053
R^2	0.000		0.002		0.010

- LAV stands for quantile regression.
- Winsorized at 1%: Winsorizing replaces the outliers – lowest 1% and highest 99% values – by the next value inwards.
- ***, **, and * indicate significance at the 1%, 5%, and 10% levels.

Back

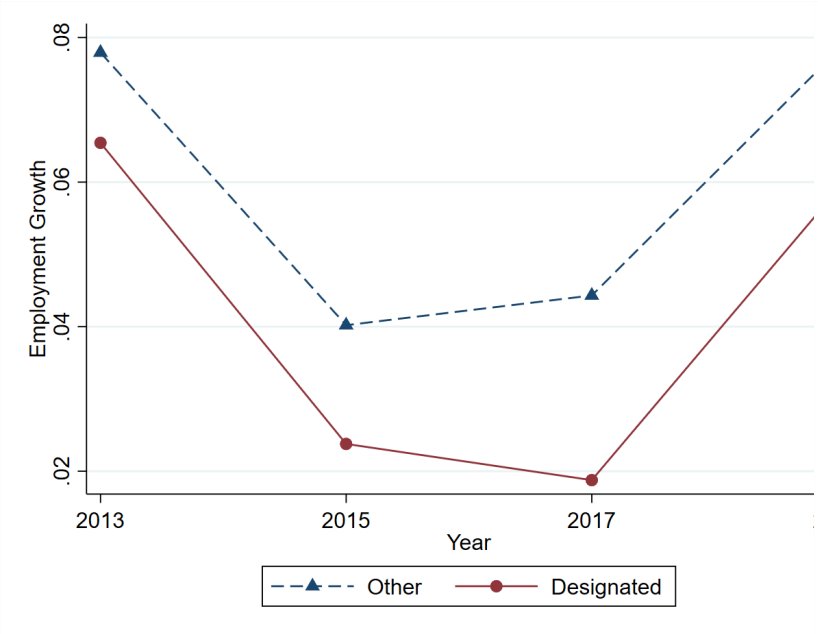
All Eligible Tracts: Establishment Growth

	(1) OLS	(2) LAV	(3) OLS	(4) LAV	(5) OLS Winsorized at 1%
ACS Controls	No	No	Yes	Yes	Yes
D_i	-0.007	-0.005*	-0.007	-0.006**	-0.008***
	(0.007)	(0.003)	(0.007)	(0.003)	(0.003)
P_t	-0.097***	-0.091***	-0.098***	-0.093***	-0.109***
	(0.004)	(0.002)	(0.004)	(0.002)	(0.002)
$D_i P_t$	0.021**	0.020***	0.022**	0.018***	0.030***
	(0.010)	(0.004)	(0.010)	(0.004)	(0.004)
$Emp.Growth_{2013-2015}$			0.127***	0.016***	0.021***
			(0.008)	(0.003)	(0.003)
Observations	52,060	52,060	52,053	52,053	52,053
R^2	0.011		0.018		0.080

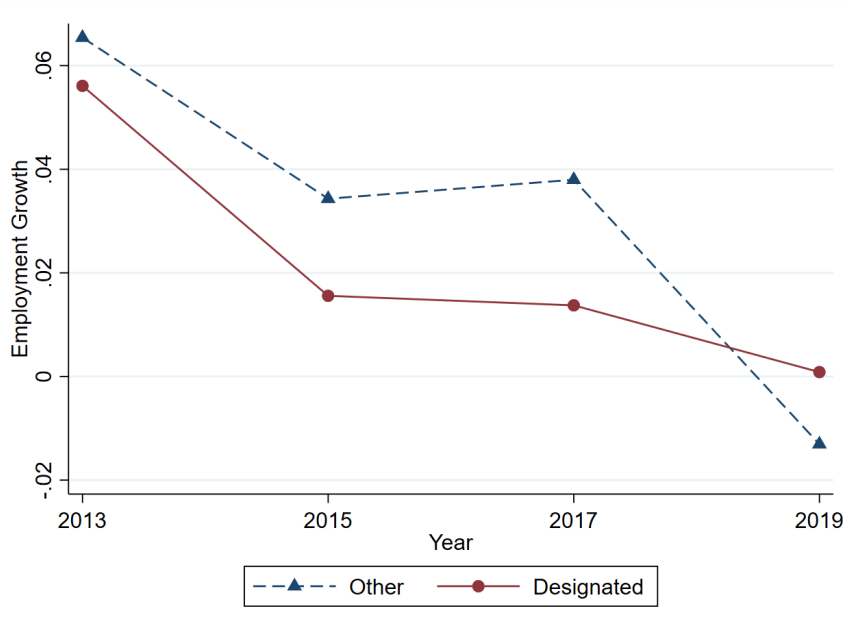
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- ***, **, and * indicate significance at the 1%, 5%, and 10% levels.

Back

2-Yr Employment Growth in Eligible Tracts



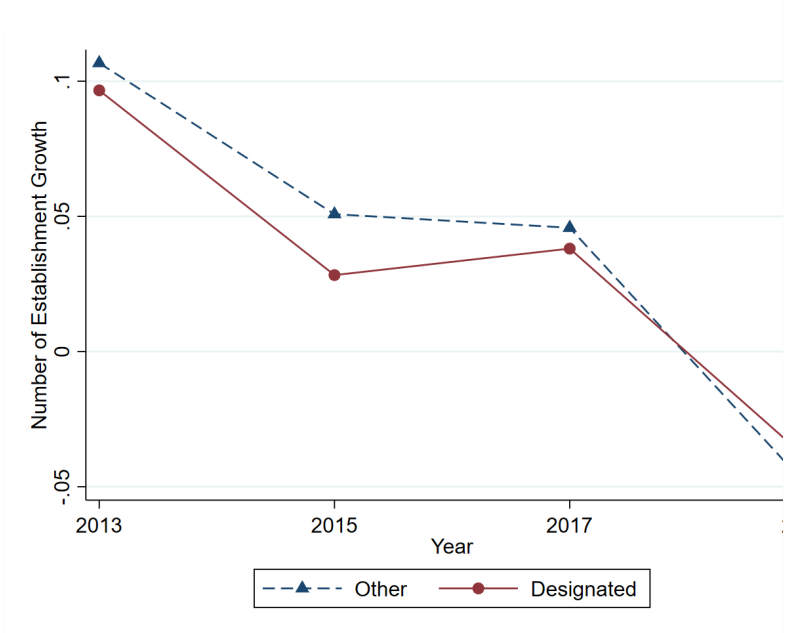
(a) Raw Data



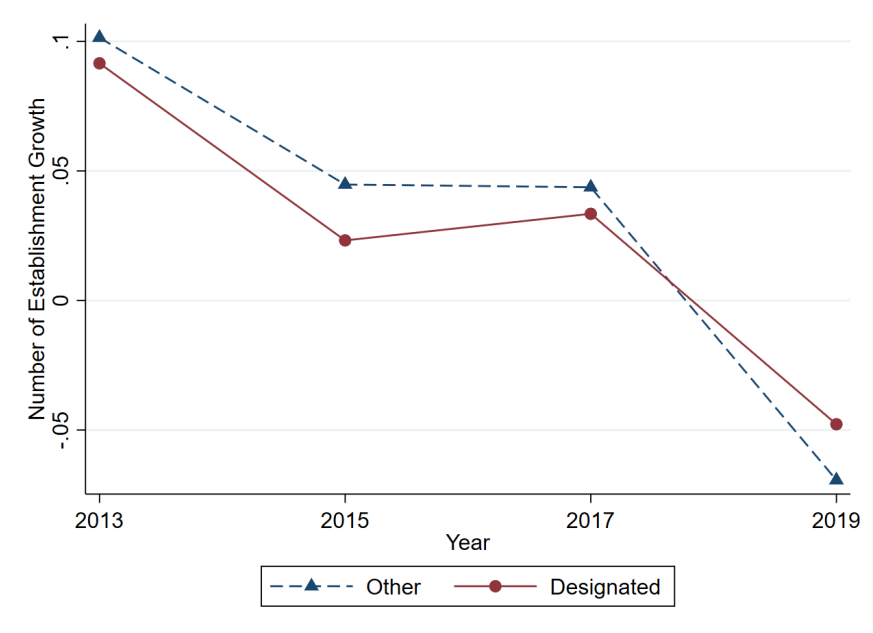
(b) Winsorized at 1%

Back

2-Yr Establishment Growth in Eligible Tracts



(a) Raw Data



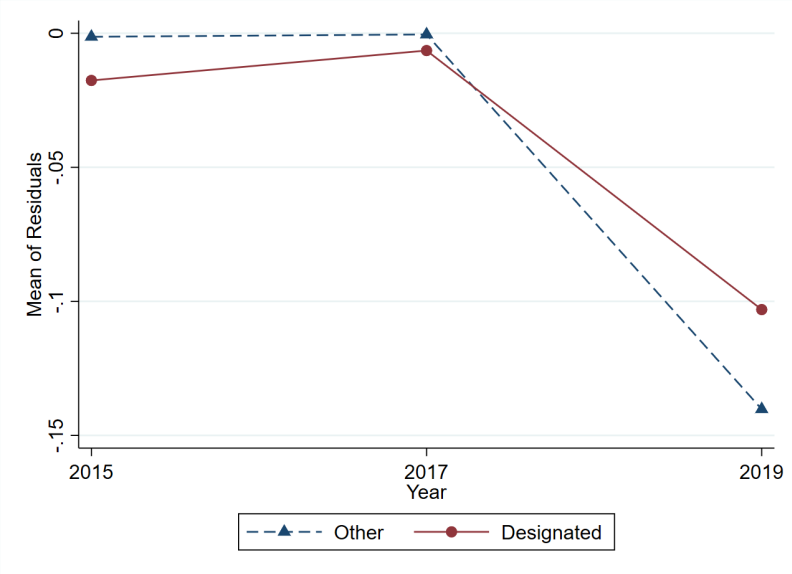
(b) Winsorized at 1%

Back

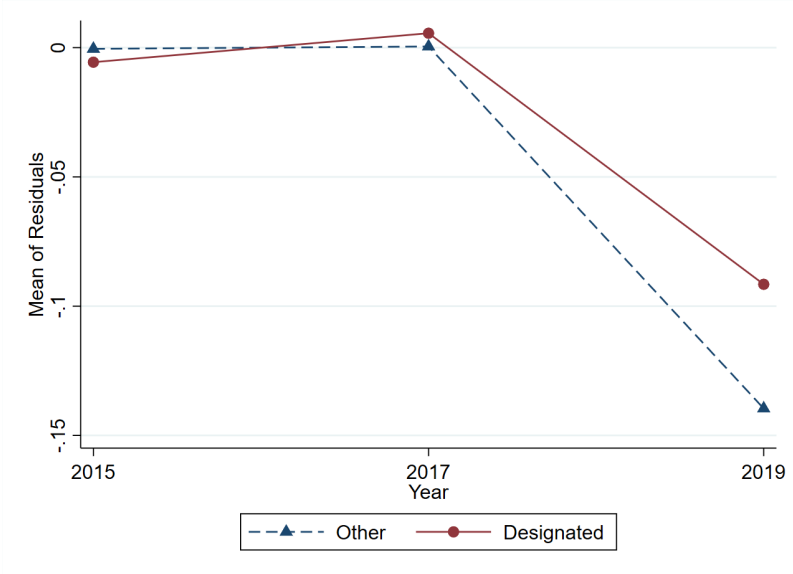
Pre-Trends Prediction

- Designated and Other tracts are systematically different. How to check on pre-trends?
- Regress 2-year growth (Y), pooling 2013-15 and 2015-17, on
  - Growth from 2011-2013,
  - ACS control variables,
  - With and without Designated dummy variable,
- Generate predicted growth in-sample and **2017-2019**.
- Graph error = actual less predicted.

Actual Less Forecast, Establishment Growth



(a) No Designated Dummy

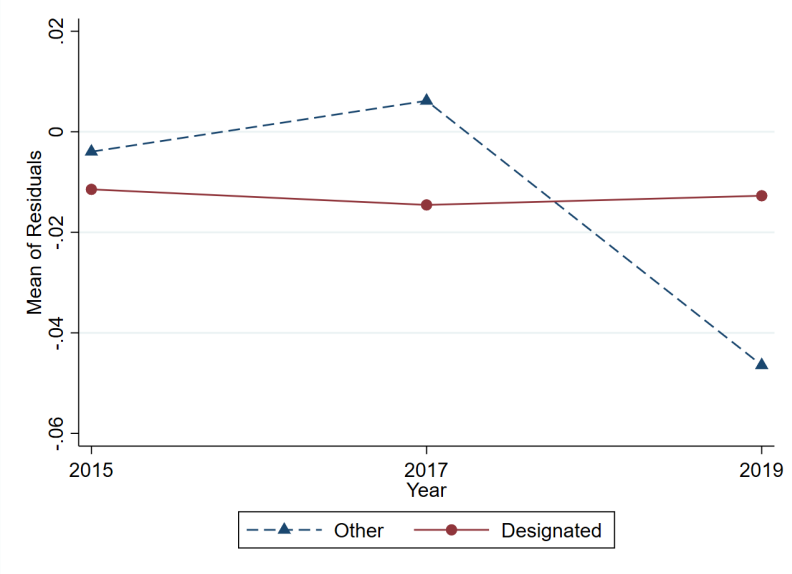


(b) With Designated Dummy

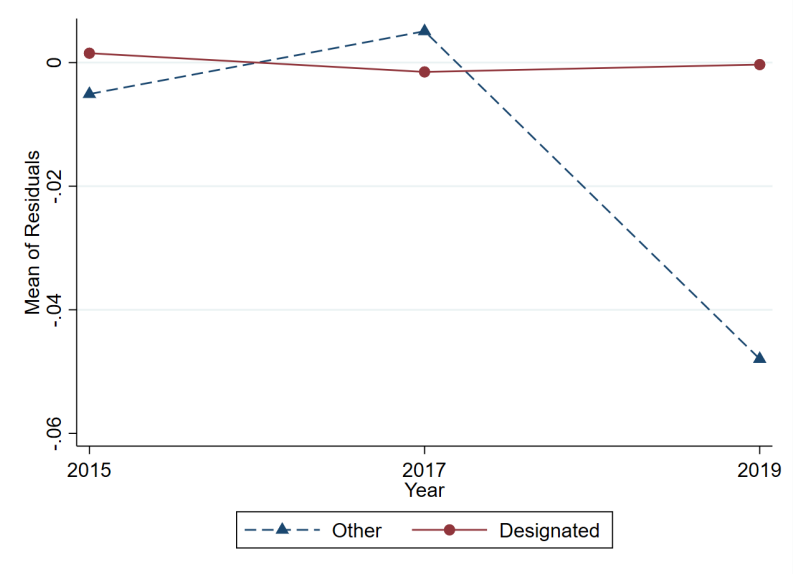
* Raw Data (no winsorizing), metropolitan-area tracts only.

Back

Actual Less Forecast, Employment Growth



(a) No Designated Dummy



(b) With Designated Dummy

* Raw Data (no winsorizing), metropolitan-area tracts only.

▸ Back

Political Tract Selection: Employment Growth

	(1) LAV	(2) OLS Winsorized at 1%	(3) LAV	(4) OLS Winsorized at 1%
D_i	-0.014***	-0.019***	-0.014***	-0.019***
	(0.004)	(0.005)	(0.004)	(0.005)
P_t	-0.093***	-0.077***	-0.093***	-0.077***
	(0.002)	(0.003)	(0.002)	(0.003)
$D_i P_t$	0.031***	0.046***	0.037***	0.058***
	(0.005)	(0.007)	(0.006)	(0.009)
$\%same_party$	0.001	0.004	0.002	0.006*
	(0.002)	(0.003)	(0.002)	(0.003)
$D_i P_t \%same_party$			-0.011	-0.024**
			(0.007)	(0.010)
$Emp.Growth_{2013-2015}$	-0.014***	-0.010*	-0.013***	-0.010*
	(0.004)	(0.006)	(0.004)	(0.006)
Observations	40,716	40,716	40,716	40,716
R^2		0.023		0.024

All regressions include a full set of ACS controls.

***, **, and * indicate significance at the 1%, 5%, and 10% levels.

▸ Return

Employment Growth: LIC vs non-LIC

	(1)	(2)	(3)	(4)
	LIC		Non-LIC	
	LAV	OLS	LAV	OLS
		Winsorized at 1%		Winsorized at 1%
ACS Controls	Yes	Yes	Yes	Yes
D_i	-0.015***	-0.023***	-0.005	0.004
	(0.004)	(0.005)	(0.022)	(0.029)
P_t	-0.094***	-0.084***	-0.077***	-0.058***
	(0.002)	(0.003)	(0.004)	(0.006)
$D_i P_t$	0.033***	0.050***	0.133***	0.124***
	(0.005)	(0.007)	(0.032)	(0.041)
$Emp.Growth_{2013-2015}$	-0.006	-0.008	-0.003	0.001
	(0.005)	(0.007)	(0.010)	(0.012)
Observations	31,434	31,434	9,510	9,510
R^2		0.021		0.016

All regressions include a full set of ACS controls.
***, **, and * indicate significance at the 1%, 5%, and 10% levels.

Back

Robustness: Exclude Top Census Tracts

	(1) LAV Benchmark	(2) LAV Drop Top 5% of Tracts	(3) LAV Drop Top 10% of Tracts
D_i	-0.0139***	-0.0148***	-0.0173***
	(0.00348)	(0.00358)	(0.00369)
P_t	-0.0911***	-0.0908***	-0.0907***
	(0.00209)	(0.00210)	(0.00209)
$D_i P_t$	0.0293***	0.0187***	0.0106**
	(0.00485)	(0.00500)	(0.00516)
Emp.Growth$_{2013-2015}$	-0.00472	-0.00449	-0.00414
	(0.00422)	(0.00431)	(0.00433)
Observations	40,951	40,482	39,964

- Columns (2) and (3): Top 5% or 10% of tracts by employment growth in 2017-2019 within each state were excluded.
- All regressions include a full set of ACS controls.
- ***, **, and * indicate significance at the 1%, 5%, and 10% levels.

Back

Doubly Robust Difference-in-Difference Sant'Anna, Zhao (2020)

	All		Metropolitan Area	
	(1)	(2)	(3)	(4)
	Raw	Winsorized at 1%	Raw	Winsorized at 1%
	Panel A: Employment Growth			
$\hat{\tau}$	0.033**	0.042***	0.053***	0.054***
	(0.016)	(0.007)	(0.007)	(0.020)
t-value	2.028	6.037	7.529	2.672
	Panel B: Establishment Growth			
$\hat{\tau}$	0.023**	0.032***	0.046***	0.044***
	(0.009)	(0.004)	(0.005)	(0.007)
t-value	2.544	8.050	9.681	6.397

$\hat{\tau}$ is the average treatment effect on the treated (ATT).

***, **, and * denote significance at the 1%, 5%, and 10% levels.

Back

Employment Growth: Control = Nearby Tracts

	(1)	(2)	(3)	(4)
	3-mile Ring		LIC + 3-mile Ring	
	LAV	OLS	LAV	OLS
		Winsorized at 1%		Winsorized at 1%
ACS Controls	Yes	Yes	Yes	Yes
D_i	-0.015***	-0.023***	-0.016***	-0.020***
	(0.004)	(0.005)	(0.004)	(0.004)
P_t	-0.102***	-0.098***	-0.129***	-0.155***
	(0.003)	(0.004)	(0.003)	(0.003)
$D_i P_t$	0.040***	0.064***	0.041***	0.055***
	(0.005)	(0.007)	(0.005)	(0.005)
$Emp.Growth_{2013-2015}$	-0.014***	-0.022***	0.003	0.003
	(0.005)	(0.007)	(0.005)	(0.005)
Observations	27,543	27,543	27,543	27,543
R^2		0.027		0.141

All regressions include a full set of ACS controls.

***, **, and * indicate significance at the 1%, 5%, and 10% levels.

Back

Establishment Growth: Control = Nearby Tracts

	(1)	(2)	(3)	(4)
	3-mile Ring		LIC + 3-mile Ring	
	LAV	OLS	LAV	OLS
		Winsorized at 1%		Winsorized at 1%
ACS Controls	Yes	Yes	Yes	Yes
D_i	-0.015***	-0.023***	-0.015***	-0.019***
	(0.004)	(0.005)	(0.004)	(0.004)
P_t	-0.103***	-0.098***	-0.128***	-0.153***
	(0.003)	(0.004)	(0.003)	(0.003)
$D_i P_t$	0.040***	0.062***	0.040***	0.053***
	(0.005)	(0.008)	(0.005)	(0.005)
$Emp.Growth_{2013-2015}$	-0.008	-0.021***	0.003	0.004
	(0.005)	(0.008)	(0.005)	(0.005)
Observations	23,580	23,580	23,580	23,580
R^2		0.026		0.136

All regressions include a full set of ACS controls.

***, **, and * indicate significance at the 1%, 5%, and 10% levels.

Back

Robustness: State Fixed Effects

	(1)	(2)	(3)	(4)
	Employment Growth		Establishment Growth	
	LAV	OLS	LAV	OLS
		Winsorized at 1%		Winsorized at 1%
ACS Controls	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
D_i	-0.014***	-0.019***	-0.011***	-0.016***
	(0.004)	(0.005)	(0.003)	(0.003)
P_t	-0.093***	-0.077***	-0.119***	-0.141***
	(0.002)	(0.003)	(0.002)	(0.002)
$D_i P_t$	0.032***	0.045***	0.033***	0.043***
	(0.005)	(0.007)	(0.004)	(0.005)
$\text{Emp.Growth}_{2013-2015}$	-0.013***	-0.011*	-0.000	0.007*
	(0.004)	(0.006)	(0.004)	(0.004)
Observations	40,951	40,951	40,951	40,951
R^2		0.023		0.140

All regressions include a full set of ACS controls.

***, **, and * indicate significance at the 1%, 5%, and 10% levels.

Back

Robustness: Census Tract Fixed Effects

	(1)	(2)	(3)	(4)
	Employment Growth		Establishment Growth	
	LAV	OLS	LAV	OLS
		Winsorized at 1%		Winsorized at 1%
ACS Controls	Yes	Yes	Yes	Yes
Census Tract FE	Yes	Yes	Yes	Yes
D_i	0.011	0.007***	0.001	0.004**
	(0.153)	(0.003)	(0.075)	(0.002)
P_t	-0.042	-0.072***	-0.144*	-0.139***
	(0.163)	(0.003)	(0.083)	(0.002)
$D_i P_t$	0.043	0.039***	0.055	0.052***
	(0.309)	(0.006)	(0.175)	(0.005)
$\text{Emp.Growth}_{2013-2015}$		0.035***		0.048***
		(0.002)		(0.001)
Observations	61,805	61,805	61,805	61,805
R^2		0.026		0.155

All regressions include a full set of ACS controls.

***, **, and * indicate significance at the 1%, 5%, and 10% levels.

Back

What Happened to Nearby Tracts?

- Sample includes 5 groups of tracts:

group k	description of contiguity group	treatment k
0	all eligible tracts (including OZs)	D_i
1	tracts, contiguous to group 0 tracts	$D_i G_{i1}$
2	tracts, contiguous to group 1 tracts	$D_i G_{i2}$
3	tracts, contiguous to group 2 tracts	$D_i G_{i3}$
4	tracts, contiguous to group 3 tracts	$D_i G_{i4}$

- $G_{i,k} = 1$ if tract i is in group $k = 1, 2, 3, 4$ and 0 otherwise.
- Run extended specification:

$$Y_{i,t} = \alpha_0 + \alpha_{0,k} G_{i,k} + (\alpha_1 + \alpha_{1,k} G_{i,k}) P_t + (\alpha_2 + \alpha_{2,k} G_{i,k}) D_i + (\alpha_3 + \alpha_{3,k} G_{i,k}) D_i P_t + \mathbf{X}_\mathrm{i} \alpha_X + \epsilon_{i,t}$$

- Results: positive spillovers to contiguous tracts up to the second degree of contiguity and net zero effect further out.

Employment Growth: Spillovers on Nearby Tracts

	(1) OLS Winsorized at 1%	(2) Test of net effect
D_i	-0.018***	
	(0.005)	
P_t	-0.080***	
	(0.003)	
$D_i P_t$	0.045***	
	(0.007)	
$D_i G_{i1} P_t$	-0.026***	0.019***
	(0.009)	p=0.0006
$D_i G_{i2} P_t$	-0.027**	0.018**
	(0.010)	p=0.0134
$D_i G_{i3} P_t$	-0.030**	0.015
	(0.015)	p=0.2493
$D_i G_{i4} P_t$	-0.041	0.004
	(0.027)	p=0.8512
$Emp.Growth_{2013-2015}$	0.003*	
	(0.002)	
Observations	127,718	
R^2	0.025	

***, **, and * denote significance at the 1%, 5%, and 10% levels.

▸ Back

Heterogeneity: Establishment Births and Deaths

Old or new establishments?

- Previous results: the dependent variable was the growth in the **net** number of establishments.
- Here: the dependent variable is the percent of entered/exited establishments. Focus: establishment births and deaths.
- Result: Designated tracts experienced
  - $\uparrow$ the number of new establishments,
  - $\downarrow$ the number of failing establishments.

Establishment Birth and Death Regressions

	Percent of Entered Establishment		Percent of Exiting Establishment	
	(1) LAV	(2) OLS Winsorized at 1%	(3) LAV	(4) OLS Winsorized at 1%
D_i	-0.025***	-0.031***	-0.012***	-0.011***
	(0.003)	(0.003)	(0.002)	(0.002)
P_t	-0.056***	-0.089***	-0.014***	-0.008***
	(0.002)	(0.002)	(0.001)	(0.001)
$D_i P_t$	0.031***	0.040***	-0.005*	-0.009***
	(0.004)	(0.004)	(0.003)	(0.002)
$Emp.Growth_{2013-2015}$	0.083***	0.104***	0.150***	0.112***
	(0.003)	(0.003)	(0.002)	(0.002)
Observations	40,944	40,944	40,944	40,944
R^2		0.177		0.211

ACS Controls are included in all specifications.

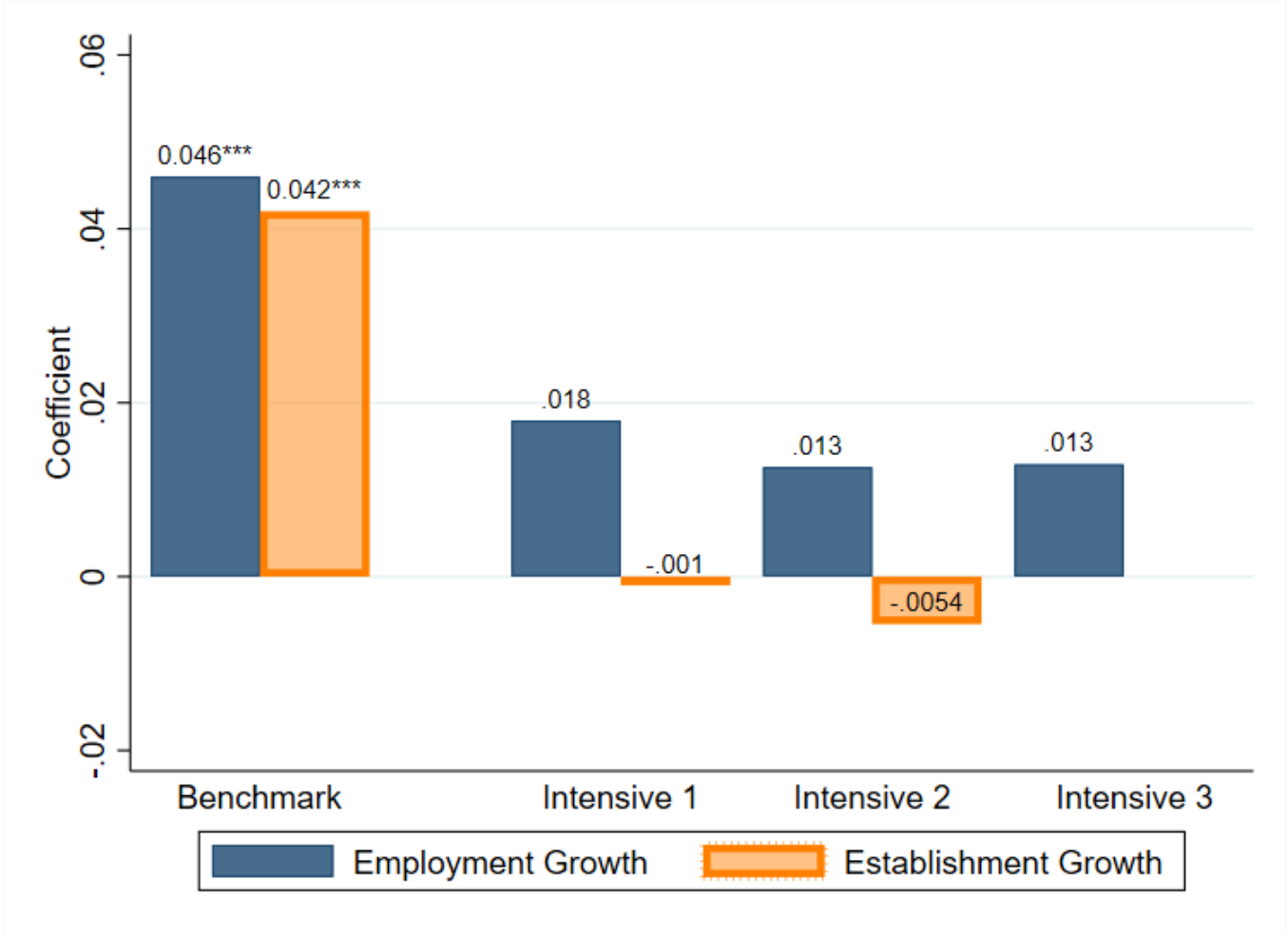
***, **, and * indicate significance at the 1%, 5%, and 10% levels.

Heterogeneity: Intensive or Extensive Margin

Did policy encourage the growth of existing establishments (intensive margin) or new establishments (extensive margin)?

- Three definitions of "existing" establishments:
  1. Establishments that existed in all years: 2013, 2015, 2017, 2019,
  2. Establishments that existed in 2015, 2017, 2019,
  3. Establishments that satisfy [2] + remained in the same tract in 2015, 2017, and 2019.
- Results: creation of new establishments – the extensive margin – is driving positive employment growth.

Heterogeneity: Intensive or Extensive Margin



***, **, and * denote significance at the 1%, 5%, and 10% levels.

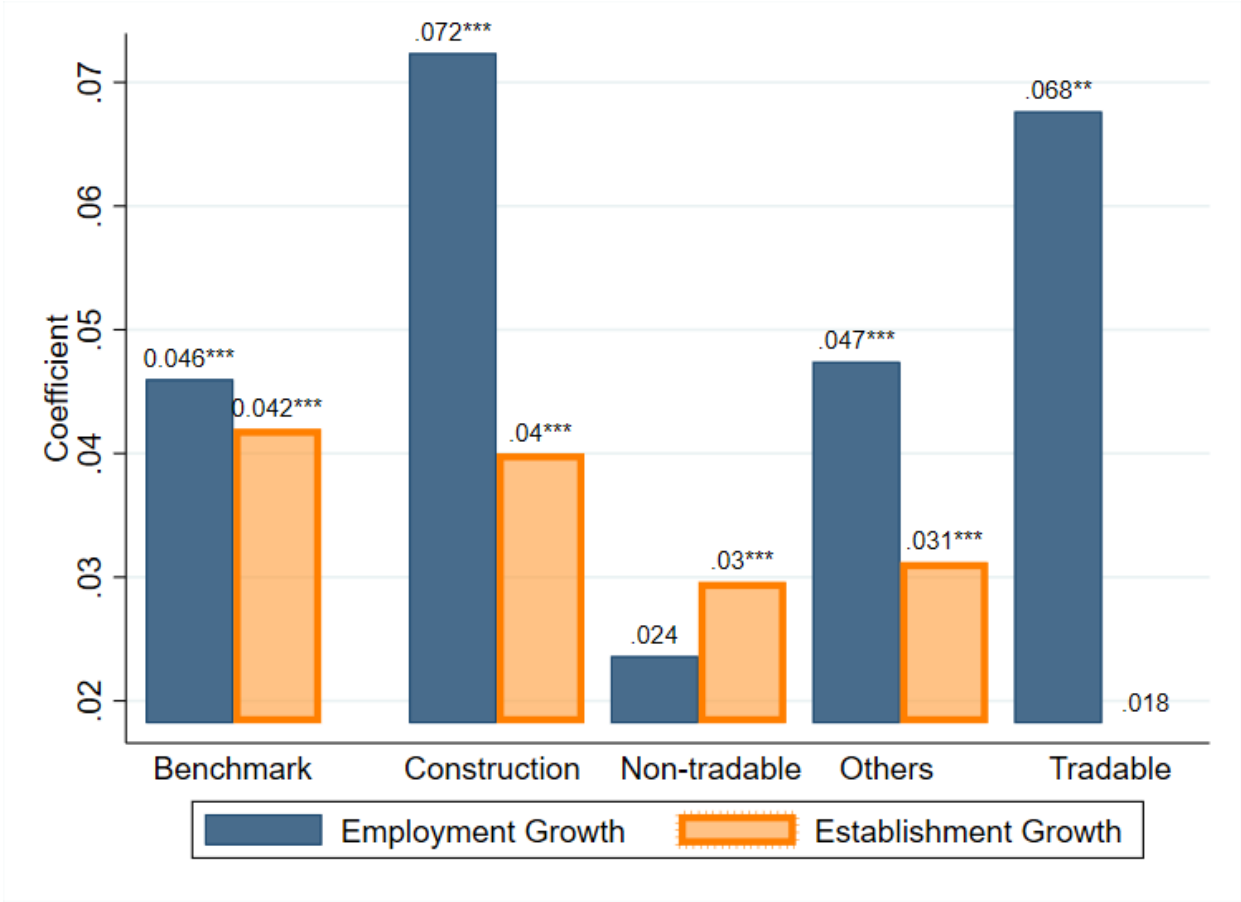
Benchmark: estimates for establishments in all industries in metro areas.

Back

Mian and Sufi (2014) Industry Classification

- Based on 4-digit NAICS industries.
- Classify industries into 4 types:
    1. Construction: industries related to construction, real estate, and land development,
    2. Non-tradable: retail and restaurants,
    3. Tradable: imports plus exports equal to at least $10,000 per worker, or total exports plus imports exceeds $500M,
    4. Others: all other.

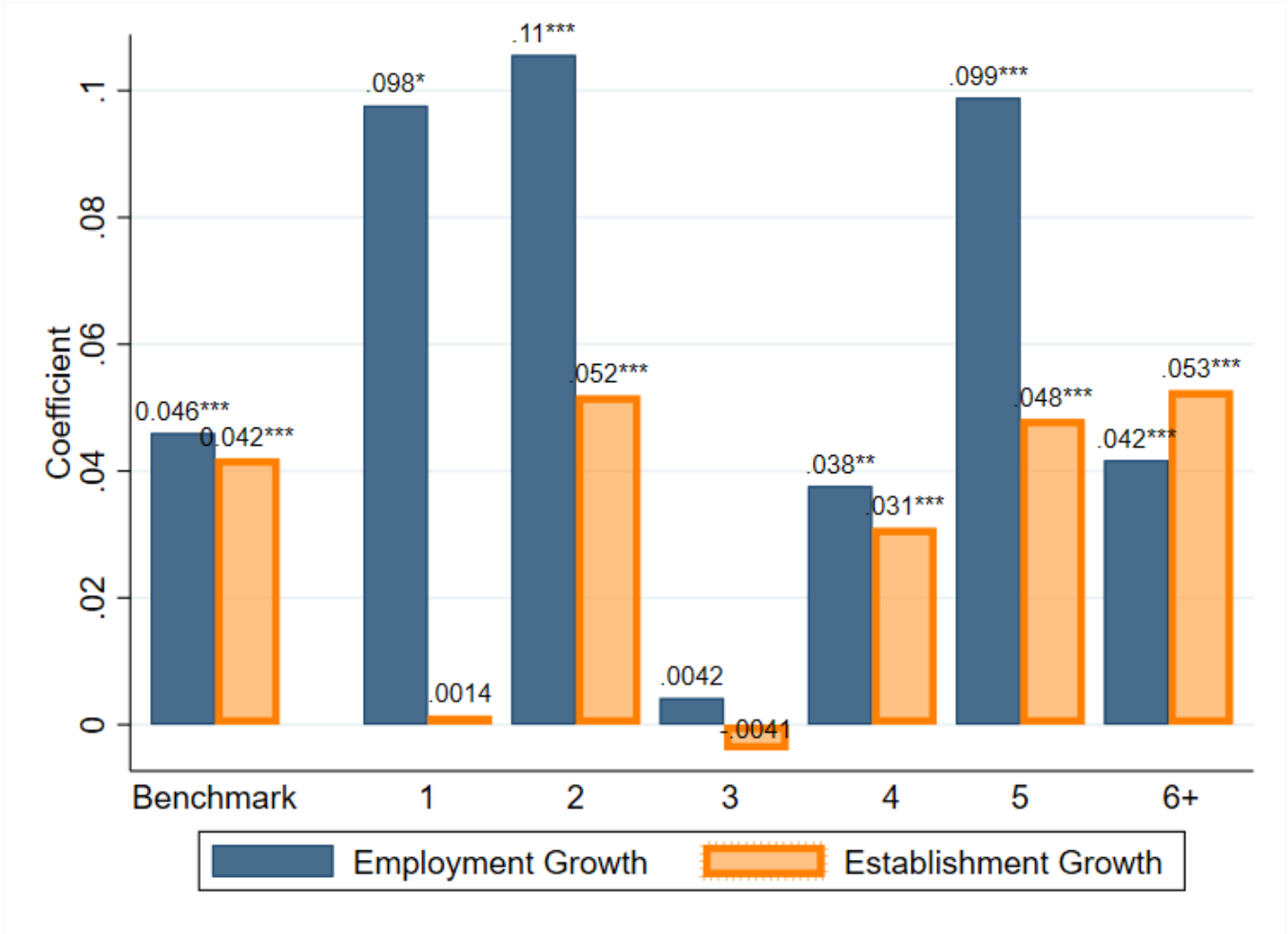
Estimates by Mian&Sufi's Industries



Benchmark: estimates for establishments in all industries in metro areas.
***, **, and * denote significance at the 1%, 5%, and 10% levels.

▸ Return

Estimates by 1-digit NAICS Industry



1-digit NAICS Industries: (1) agriculture, (2) construction, (3) manufacturing, (4) trade, (5) information, FIRE and management, and (6) services.
Benchmark: estimates for establishments in all industries in metro areas.

***, **, and * denote significance at the 1%, 5%, and 10% levels.

▸ Return

1-digit NAICS Industries

2-digit NAICS Sectors	Description	1-digit NAICS Sectors
11	Agriculture, Forestry, Fishing, and Hunting (not covered in the economic census)	1
21	Mining, Quarrying, and Oil and Gas Extraction	2
22	Utilities	
23	Construction	
31-33	Manufacturing	3
42	Wholesale Trade	4
44-45	Retail Trade	
48-49	Transportation and Warehousing	
51	Information	5
52	Finance and Insurance	
53	Real Estate and Rental and Leasing	
54	Professional, Scientific, and Technical Services	
55	Management of Companies and Enterprises	
56	Administrative and Support and Waste Management and Remediation Services	
61	Educational Services	6
62	Health Care and Social Assistance	
71	Arts, Entertainment, and Recreation	
72	Accommodation and Food Services	
81	Other Services (except Public Administration)	
92	Public Administration (not covered in the economic census)	

Source: `https://www.census.gov/programs-surveys/economic-census/guidance/understanding-naics.html`. Return

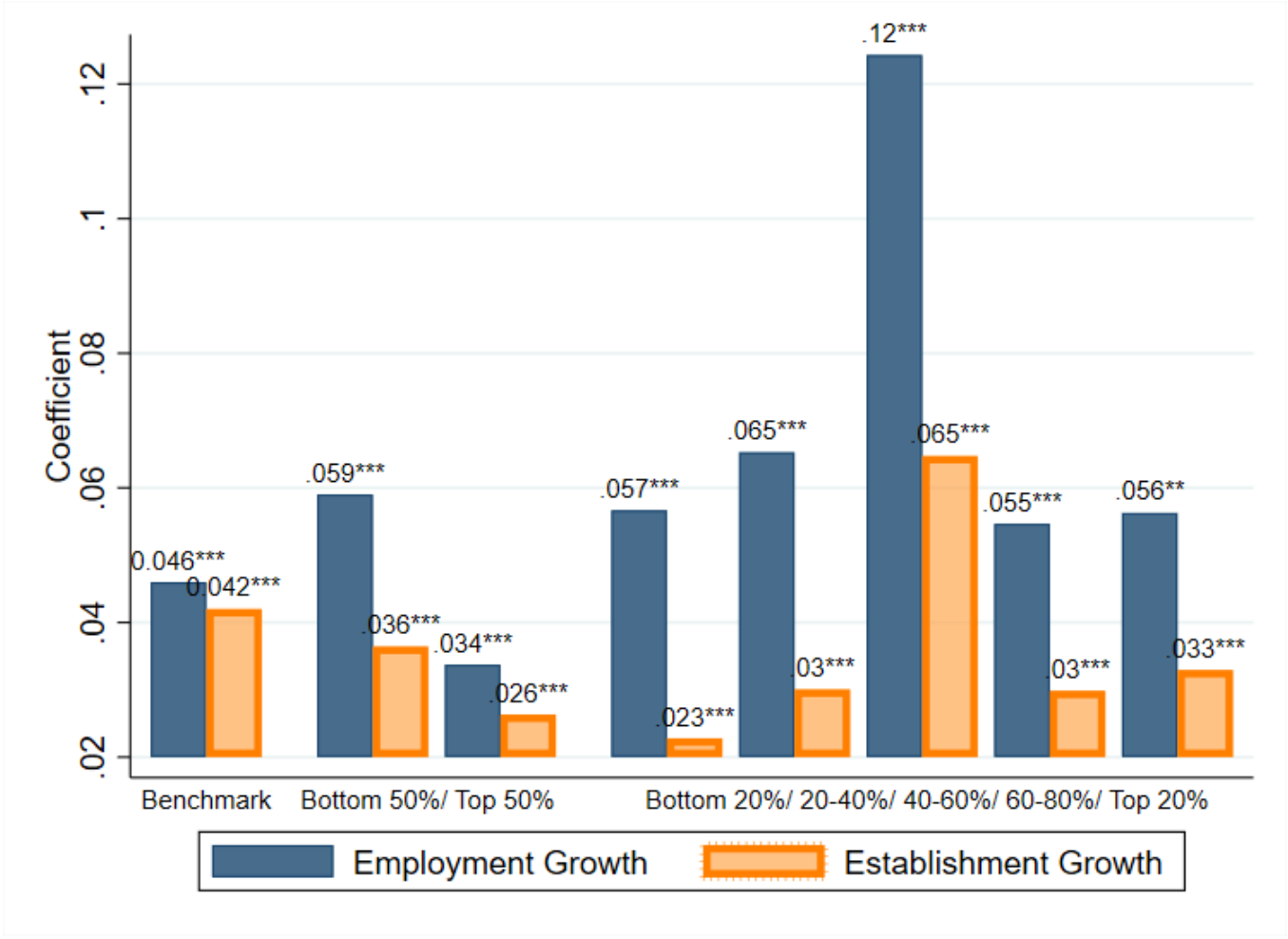
Heterogeneity: Who Gets Hired?

Oldenski (2012)'s skill-intensity measure:

- The average educational level of labor used in industry.
- From 1 for "some high school" to 5 for "graduate school".
- Available for 4-digit NAICS industries.
- Oldenski's Source: 2004 American Community Survey.

We classify industries into education quantiles based on this skill-intensity measure.

Heterogeneity: Who Gets Hired?
Industries across all skill-levels Experience Growth



Benchmark: estimates for establishments in all industries in metro areas. ***, **, and * denote significance at the 1%, 5%, and 10% levels.

▸ Return

Heterogeneity: Tract Characteristics

Larger effects in tracts with a lower share of white:



Benchmark: estimates for establishments in all industries in metro areas. ***, **, and * denote significance at the 1%, 5%, and 10% levels.

▸ Return