

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

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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.

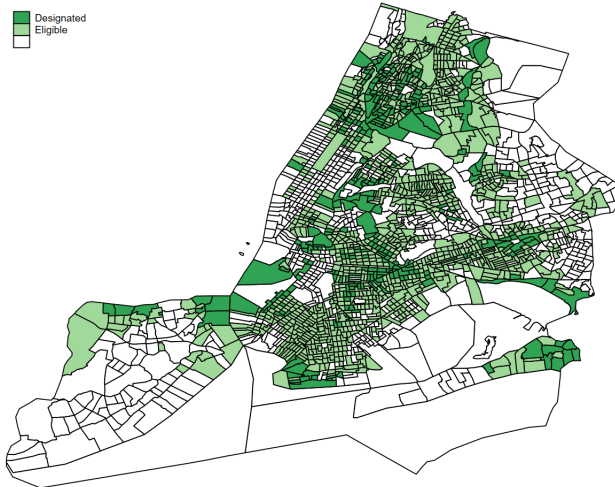
Did the policy affect its intended outcome – job growth?

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 and past employment growth:

$$Y_{i,t} = \alpha_0 + \alpha_1 P_t + \alpha_2 D_i + \alpha_3 D_i P_t + \alpha_X X_i + \alpha_Y Y_{i,t-1} + \epsilon_{i,t},$$

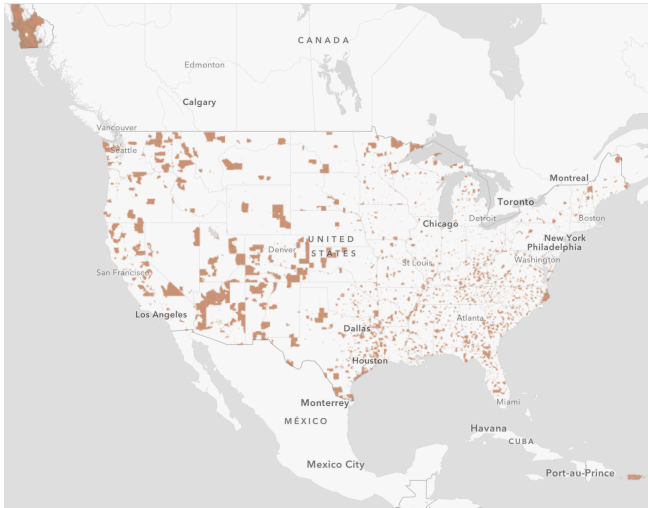
Eligible Tracts in New York City



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

▶ Zoom In

All Opportunity Zones



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

Limitations of the Empirical Strategy

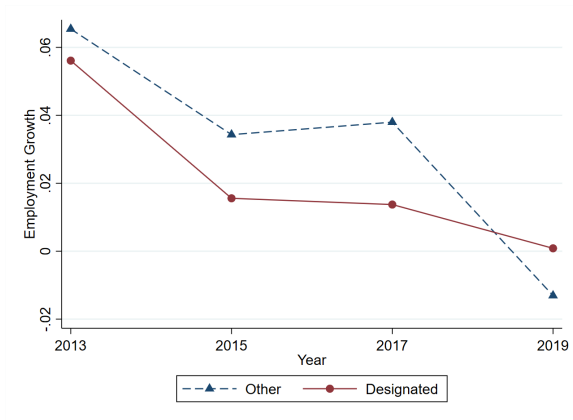
What we can not identify the effect of the tax law on

- 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.

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.

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

| | Metropolitan Area | | Non-Metropolitan Area | |
|---------------------------------|----------------------|----------------------|-----------------------|---------------------|
| | (1) LAV | (2) OLS | (3) LAV | (4) OLS |
| | Winsorized at 1% | | Winsorized at 1% | |
| D_i | -0.014*** (0.003) | -0.019*** (0.005) | 0.008 (0.007) | 0.015 (0.012) |
| P_t | -0.091*** (0.002) | -0.077*** (0.003) | -0.016*** (0.004) | 0.044*** (0.007) |
| $D_i P_t$ | 0.029*** (0.005) | 0.046*** (0.007) | -0.012 (0.010) | -0.000 (0.015) |
| Emp.Growth ₂₀₁₃₋₂₀₁₅ | -0.005 (0.004) | -0.005 (0.006) | 0.021*** (0.007) | 0.048*** (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.

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.

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.

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.

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 ≥ 5 (7) years

2. If make a new investment, can
 - ▶ **Eliminate** federal taxes on capital gains if held for ≥ 10 years

Eligible Census Tracts Criteria

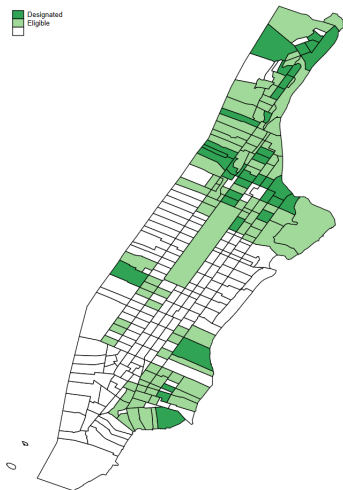
A census tract is eligible if it is

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.

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 |

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*** (0.003) | -0.016*** (0.003) | 0.016*** (0.006) | 0.024*** (0.007) |
| P_t | -0.117*** (0.002) | -0.140*** (0.002) | -0.015*** (0.003) | 0.003 (0.004) |
| $D_i P_t$ | 0.032*** (0.004) | 0.043*** (0.005) | -0.022*** (0.007) | -0.023** (0.009) |
| $Emp.Growth_{2013-2015}$ | 0.010*** (0.004) | 0.015*** (0.004) | 0.045*** (0.005) | 0.039*** (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.

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) | -0.015*** (0.003) | -0.018 (0.015) | -0.009*** (0.003) | -0.012*** (0.005) |
| P_t | 0.001 (0.009) | -0.072*** (0.002) | -0.003 (0.009) | -0.074*** (0.002) | -0.050*** (0.003) |
| $D_i P_t$ | 0.025 (0.022) | 0.021*** (0.004) | 0.028 (0.021) | 0.021*** (0.004) | 0.036*** (0.006) |
| $Emp.Growth_{2013-2015}$ | | | 0.098*** (0.017) | -0.003 (0.004) | 0.009* (0.005) |
| Observations | 52,060 | 52,060 | 52,053 | 52,053 | 52,053 |
| R^2 | 0.000 | | 0.002 | | 0.010 |

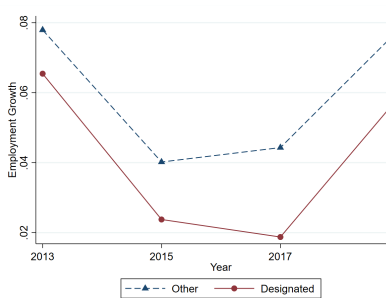
- LAV stands for quantile regression.
- Winsorized at 1%: Winsorizing replaces the outliers – lowest 1% and highest 99% values – by the next value inwards.
- ***, **, and * indicate significance at the 1%, 5%, and 10% levels.

All Eligible Tracts: Establishment Growth

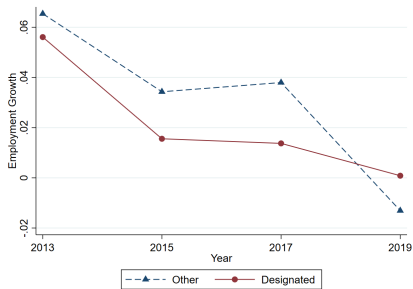
| | (1) OLS | (2) LAV | (3) OLS | (4) LAV | (5) OLS |
|--------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | | | | | Winsorized at 1% |
| ACS Controls | No | No | Yes | Yes | Yes |
| D_i | -0.007 (0.007) | -0.005*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

- 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.

2-Yr Employment Growth in Eligible Tracts



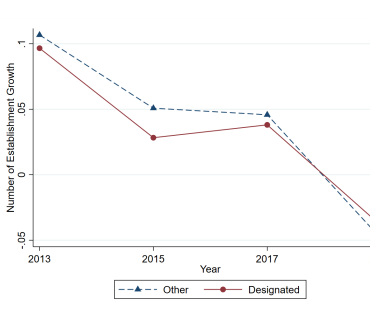
(a) Raw Data



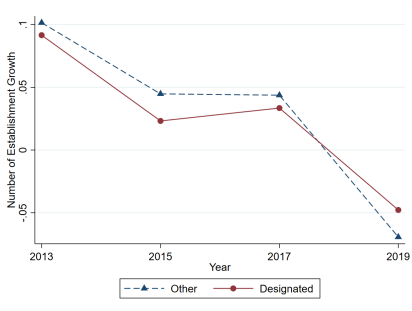
(b) Winsorized at 1%

▶ Back

2-Yr Establishment Growth in Eligible Tracts



(a) Raw Data



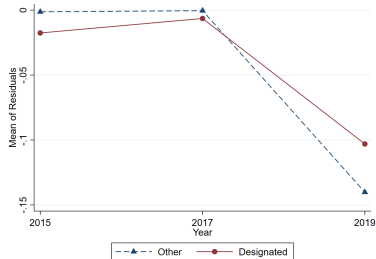
(b) Winsorized at 1%

▶ Back

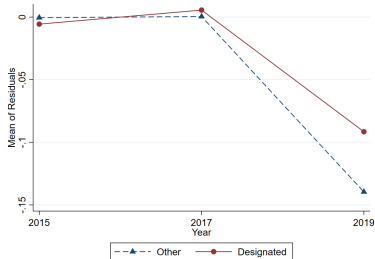
Pre-Trends Prediction

- 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

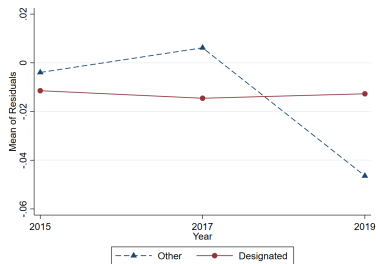


(b) With Designated Dummy

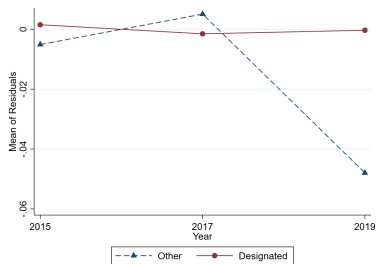
* Raw Data (no winsorizing), metropolitan-area tracts only.

▶ 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*** (0.004) | -0.019*** (0.005) | -0.014*** (0.004) | -0.019*** (0.005) |
| P_t | -0.093*** (0.002) | -0.077*** (0.003) | -0.093*** (0.002) | -0.077*** (0.003) |
| $D_i P_t$ | 0.031*** (0.005) | 0.046*** (0.007) | 0.037*** (0.006) | 0.058*** (0.009) |
| $\%same_party$ | 0.001 (0.002) | 0.004 (0.003) | 0.002 (0.002) | 0.006* (0.003) |
| $D_i P_t \%same_party$ | | | -0.011 (0.007) | -0.024** (0.010) |
| $Emp.Growth_{2013-2015}$ | -0.014*** (0.004) | -0.010* (0.006) | -0.013*** (0.004) | -0.010* (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) |
|--------------------------|----------------------|--------------------------------|----------------------|------------------------------------|
| | LAV | LIC OLS Winsorized at 1% | LAV | Non-LIC OLS Winsorized at 1% |
| ACS Controls | Yes | Yes | Yes | Yes |
| D_i | -0.015*** (0.004) | -0.023*** (0.005) | -0.005 (0.022) | 0.004 (0.029) |
| P_t | -0.094*** (0.002) | -0.084*** (0.003) | -0.077*** (0.004) | -0.058*** (0.006) |
| $D_i P_t$ | 0.033*** (0.005) | 0.050*** (0.007) | 0.133*** (0.032) | 0.124*** (0.041) |
| $Emp.Growth_{2013-2015}$ | -0.006 (0.005) | -0.008 (0.007) | -0.003 (0.010) | 0.001 (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.

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*** (0.00348) | -0.0148*** (0.00358) | -0.0173*** (0.00369) |
| P_t | -0.0911*** (0.00209) | -0.0908*** (0.00210) | -0.0907*** (0.00209) |
| $D_i P_t$ | 0.0293*** (0.00485) | 0.0187*** (0.00500) | 0.0106** (0.00516) |
| Emp.Growth ₂₀₁₃₋₂₀₁₅ | -0.00472 (0.00422) | -0.00449 (0.00431) | -0.00414 (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.

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.

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*** (0.004) | -0.023*** (0.005) | -0.016*** (0.004) | -0.020*** (0.004) |
| P_t | -0.102*** (0.003) | -0.098*** (0.004) | -0.129*** (0.003) | -0.155*** (0.003) |
| $D_i P_t$ | 0.040*** (0.005) | 0.064*** (0.007) | 0.041*** (0.005) | 0.055*** (0.005) |
| $Emp.Growth_{2013-2015}$ | -0.014*** (0.005) | -0.022*** (0.007) | 0.003 (0.005) | 0.003 (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*** (0.004) | -0.023*** (0.005) | -0.015*** (0.004) | -0.019*** (0.004) |
| P_t | -0.103*** (0.003) | -0.098*** (0.004) | -0.128*** (0.003) | -0.153*** (0.003) |
| $D_i P_t$ | 0.040*** (0.005) | 0.062*** (0.008) | 0.040*** (0.005) | 0.053*** (0.005) |
| $Emp.Growth_{2013-2015}$ | -0.008 (0.005) | -0.021*** (0.008) | 0.003 (0.005) | 0.004 (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*** (0.004) | -0.019*** (0.005) | -0.011*** (0.003) | -0.016*** (0.003) |
| P_t | -0.093*** (0.002) | -0.077*** (0.003) | -0.119*** (0.002) | -0.141*** (0.002) |
| $D_i P_t$ | 0.032*** (0.005) | 0.045*** (0.007) | 0.033*** (0.004) | 0.043*** (0.005) |
| Emp.Growth _{2013–2015} | -0.013*** (0.004) | -0.011* (0.006) | -0.000 (0.004) | 0.007* (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 | Employment Growth | Establishment 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 (0.153) | 0.007*** (0.003) | 0.001 (0.075) | 0.004** (0.002) |
| P_t | -0.042 (0.163) | -0.072*** (0.003) | -0.144* (0.083) | -0.139*** (0.002) |
| $D_i P_t$ | 0.043 (0.309) | 0.039*** (0.006) | 0.055 (0.175) | 0.052*** (0.005) |
| Emp.Growth _{2013–2015} | | 0.035*** (0.002) | | 0.048*** (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.

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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:

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

- 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*** (0.009) | 0.019*** p=0.0006 |
| $D_i G_{i2} P_t$ | -0.027** (0.010) | 0.018** 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 (0.027) | 0.004 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.

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
 - ▶ ↑ the number of new establishments,
 - ▶ ↓ the number of failing establishments.

Establishment Birth and Death Regressions

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

ACS Controls are included in all specifications.

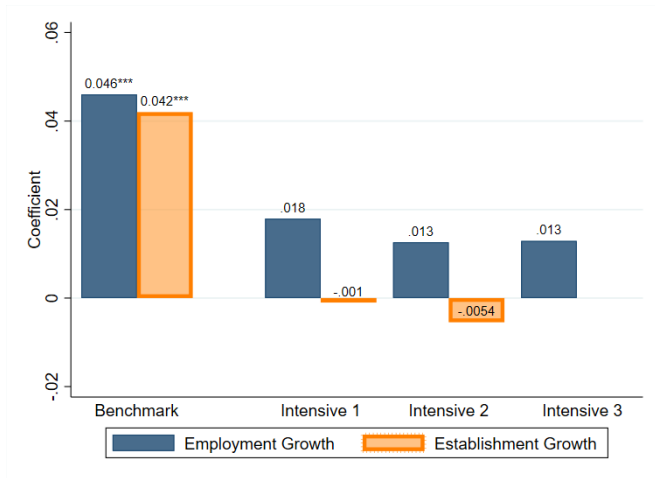
***, **, and * indicate significance at the 1%, 5%, and 10% levels.

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



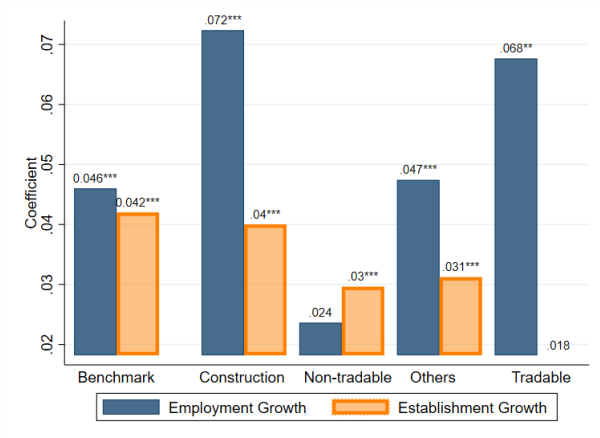
***, **, and * denote significance at the 1%, 5%, and 10% levels.

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

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.

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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.

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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 | |
| 52 | Finance and Insurance | 5 |
| 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?

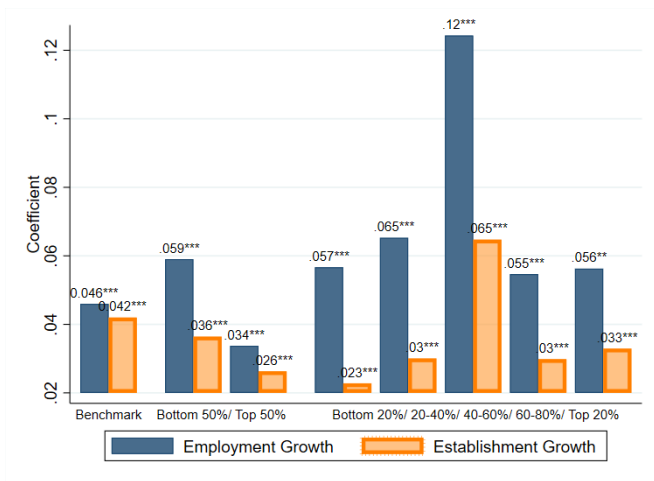
Oldenski (2012)'s skill-intensity measure:

- 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



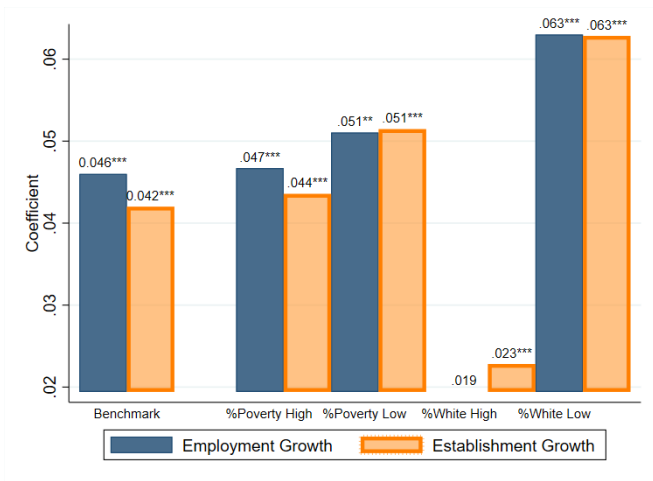
Benchmark: estimates for establishments in all industries in metro areas.

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

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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.

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