Place-Based Redistribution

Cecile Gaubert, Patrick Kline and Danny Yagan

NBER Conference on Cities, Labor Markets, and the Global Economy. October 2019

Motivation

- Widespread use of place-based policies:
  - 30% of EU budget dedicated to Regional Policy
  - U.S.: Empowerment Zones, Opportunity Zones. Target low-income census tracts.

- Two rationales for place-based policies:
  1. **Efficiency**:
     - Internalize agglomeration/congestion externalities
  2. **Equity**:
     - Places are heterogeneous in income
     - A way to transfer resources to low-income people

Motivation

- Widespread use of place-based policies:
  - 30% of EU budget dedicated to Regional Policy
  - U.S.: Empowerment Zones, Opportunity Zones. Target low-income census tracts.

- Two rationales for place-based policies:
  1. **Efficiency**: **[Traditional focus]**
     - Internalize agglomeration/congestion externalities
  2. **Equity**: **[Our focus]**
     - Places are heterogeneous in income
     - A way to transfer resources to low-income people

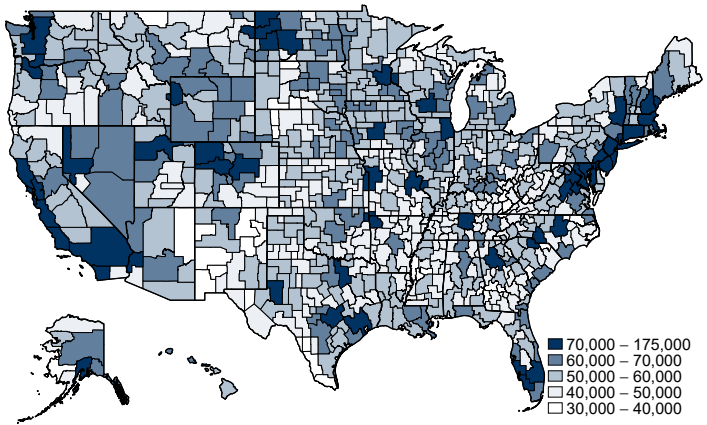
Motivation

- Widespread use of place-based policies:
  - 30% of EU budget dedicated to Regional Policy
  - U.S.: Empowerment Zones, Opportunity Zones. Target low-income census tracts.

- Two rationales for place-based policies:
  1. **Efficiency**:
     - Internalize agglomeration/congestion externalities
  2. **Equity**:
     - Places are heterogeneous in income
     - A way to transfer resources to low-income people

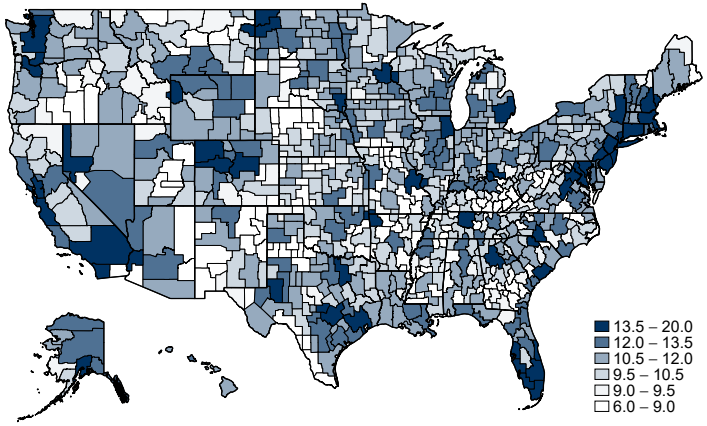
- Does place-based redistribution make sense, on top of income-based redistribution?

Redistributive Motive: Low-Income Live in West Virginia



- Mean Adjusted Gross Income by Commuting Zone in 2016 (IRS aggregates)
- Ratio of NYC to West Virginia: 2 (unadjusted); 1.5 (adjusted by local CPI)

We already redistribute NYC→WV based on income



- Mean federal income tax rates by Commuting Zone in 2016
- **This paper**: Should NYC residents pay an *extra* tax simply for living in NYC? Should WV residents get an *extra* transfer simply for living in WV?

When Can Place-Based Redistribution Be Desirable?

- Traditional view: Help poor people, not poor places

  "'Help Poor People, Not Poor Places'...is something of a mantra for many urban and regional economists... [Place-based] aid is inefficient because it increases economic activity in less productive places and decreases economic activity in more productive places." (Glaeser (2008))

- This paper:
  - Government has redistributive objectives
  - Redistribution is costly: equity-efficiency trade-off
    - Income-based redistribution is costly - distorts labor supply
    - Place-based redistribution provides equity benefits at some (different) efficiency cost
  - Characterize and compare
  - Place-based can be a useful complement to people-based redistribution

Roadmap

1. A Simple Example
2. General results
3. Quantification

A First Look at Place-Based Redistribution

- Minimal model combining key elements from Urban + Public Finance:
  - Heterogeneous skill θ, unobserved
  - Endogenous labor supply $\Rightarrow$ pre-tax income z, observed
  - Residential choice $j \in \{0, 1\}$, observed

- Households choose income z and location j maximize linear utility:

$$u(z, j; \theta) = c + a_j(\theta) - \left(\frac{z}{\theta}\right)^{\nu}$$

$$\text{such that } c + p_j = z - T(z)$$

Spatial Sorting

- Two locations $j \in \{0, 1\} = \{Elsewhere, Distressed\}$
  - Rent $p_0 > p_1$
  - (For now) same productivity - nearby neighborhoods within a city. Hence, $z_0^\theta = z_1^\theta$
  - Valuation of location amenities: $a_j(.)$
- Valuation of amenities varies with skill [Diamond '16]: $a_0'(\theta) > 0$; normalize $a_1 = 0$
- Heterogeneous preferences generates perfect spatial sorting:

$$j^\theta = 0 \Leftrightarrow a_0(\theta) > p_0 - p_1$$

  - Does amenity valuation of 0 exceeds rent premium?
  - Above a skill threshold $\underline{\theta}$, hence above income $\underline{z}$, households choose $j^\theta = 0$

Planner's Problem

- Planner maximizes:

$$SWF \equiv \int G\left(v^{\theta}\right) dF\left(\theta\right) = \mathbb{E}\left[G\left(v^{\theta}\right)\right],$$
$$\text{such that } \mathbb{E}\left[\text{tax revenues}(\theta)\right] = R$$

  - $G\left(.\right)$: Concave function. v^{θ}: Indirect utility. R: Exogenous spending.

- Using two redistributive tools:
  - Income tax $T(z)$
  - Simple **P**lace-**B**ased **R**edistribution scheme (PBR), indexed by Δ
    - Residents in 1 receive a lump-sum subsidy $\frac{\Delta}{S}$ (S: share of households in 1)
    - Residents in 0 pay lump-sum tax $\frac{\Delta}{1-S}$
    - PBR is budget neutral

Impact of PBR on Social Welfare

- Define social marginal welfare weights λ^θ = welfare benefit of transferring 1\$ to household θ:

$$\lambda^\theta = \frac{G'\left(v^\theta\right)}{\phi}$$

- Start at income tax $T(z)$ and no PBR.
  - Assumption: $T(\cdot)$ preserves $z'(\theta) > 0$ [Mirrlees '71]

- **Result**: Welfare impact of implementing PBR is:

$$\frac{dSWF}{d\Delta} = \bar{\lambda}_1 - \bar{\lambda}_0$$

  - Equity gain of reform depends on average λ in locations 0 and 1 $(\bar{\lambda}_1, \bar{\lambda}_0)$
  - No efficiency cost, to the first order:
    - Tax/Subsidy is lump sum for stayers
    - Movers do not change earnings, nor utility (initially indifferent), nor PBR budget (2nd order)

Place-Based Redistribution Increases Welfare

- Welfare impact of reform: $\bar{\lambda}_1 - \bar{\lambda}_0, > 0$?
  - Recall:

$$\lambda_j^\theta = G'\left(\underbrace{E^\theta}_{\text{Net earnings} \equiv z^\theta - T(z^\theta) - \left(\frac{z^\theta}{\theta}\right)^\nu} + a_j(\theta) - p_j\right)$$

  - Sorting implies that for each household in 0:
    - skill higher than for household in 1, hence E^θ higher
    - $a_0(\theta) - p_0 > -p_1$

- **Takeaway**: $\bar{\lambda}_1 > \bar{\lambda}_0$. Implementing PBR from Elsewhere to Distressed is welfare improving.
  - High earners sort into Elsewhere $\implies$ rationale for spatial targeting. Place as a "tag".
  - Equity gain comes at no efficiency cost
  - In contrast: equity gains come at cost of labor supply distorsion when using Income Tax
  - Unambiguous desirability of place-based redistribution

Roadmap

1. A Simple Example
2. General results
3. Quantification

Household Preferences

- Households h differ in two dimensions: skill θ^h and idiosyncratic pref. for location ε_j^h
- Utility:

$$U\left(c, a_j, \frac{z}{w_j^\theta}\right) + \varepsilon_j^h$$

  - Residing in community j requires rental fee p_j
  - Elsewhere is high-amenity and high cost-of-living: $a_0 > a_1$ and $p_0 > p_1$
  - Wage rate depends on own skill and local productivity ($\Theta_0 > \Theta_1$):

$$w_j^\theta = w\left(\theta, \Theta_j\right)$$

- Budget constraint:

$$c + p_j = z - T\left(z\right)$$

Household Earnings, and Imperfect Sorting

- z_1^h may be different from z_0^h for three different reasons
  - Local productivity $\left(w_1^h < w_0^h \Rightarrow z_1^h < z_0^h\right)$
  - Local amenity level may affect marginal utility of leisure $\left(a_1 < a_0 \Rightarrow z_1^h \gtrless z_0^h\right)$
  - Income effects on labor supply $\left(p_1 < p_0 \Rightarrow z_1^h < z_0^h\right)$. For simplicity, **Assumption 2**: There is no income effect on labor supply, i.e. $\frac{\partial z_j^h}{\partial I} = 0$ where I is unearned income.

- In this setup, we get:
  - Imperfect sorting by skill
  - Imperfect sorting by income

Welfare Impact of Introducing PBR?

- First order welfare effect of a small PBR reform starting from a place-blind system is:

$$\frac{dSWF}{d\Delta} = \underbrace{\bar{\lambda}_1 - \bar{\lambda}_0}_{\text{equity gain}} + \mathbb{E}_\theta \Big\{ \underbrace{\frac{dS^\theta}{d\Delta}}_{\text{movers, } >0} \underbrace{\left[T\left(z_1^\theta\right) - T\left(z_0^\theta\right)\right]}_{\text{efficiency cost of mover } \theta, <0} \Big\}$$

  - where S^θ: share of skill-θ households who live in 1 ($\equiv \mathbb{E}\left[j^h | \theta^h = \theta\right]$)

- Equity-efficiency trade-off of PBR

- Larger welfare effects when:
  - Large λ difference between two communities (strong sorting)
  - Mobility responses are small
  - Earnings responses among movers are small

When to help poor people *and* poor places?

- Can't the income tax achieve the same equity objective at lower efficiency cost?
- Strategy:
  - Design income tax perturbation $q\tilde{T}(z)$ around optimal income tax ($q << 1$)
  - Replicates mechanical effect of PBR taxes, income level by income level
  - Compare welfare impacts
- Tax perturbation that mimics PBR taxes levied on z-types:
  - while PBR is based on household location ($j^h = 1$ or $j^h = 0$),
  - income tax reform is based on z and is in proportion to how much z-types sort in 0

$$\tilde{T}(z) \propto \rho(z) = \Pr\left(j^h = 0 | z^h = z\right)$$

- Compare effect on welfare:

$$\frac{dSWF}{d\Delta} - \frac{dSWF}{dq}$$

Difference in Equity Benefits

$$\frac{dSWF}{d\Delta} - \frac{dSWF}{dq} = \text{Difference in Equity Gains} + \text{Difference in Efficiency Cost}$$

- Difference in Equity Gains:

$$\mathbb{E}\left[cov\left(\lambda^h, j^h | z^h\right)\right] \lesseqgtr 0$$

  - Within an income level z, which households have a higher social welfare weight λ - those who live in Elsewhere (0) or Distressed (1) ?

- Can go either way:
  - If "cost-of-living effect" dominates:

    Higher rents in 0 $\rightarrow$ higher λ in 0 (within z)
  - If "amenity effect" dominates:

    Higher amenities in 0 $\rightarrow$ lower λ in 0 (within z)

Difference in Efficiency Cost

$$\frac{dSWF}{d\Delta} - \frac{dSWF}{dq} = \text{Difference in Equity Gains} + \text{Difference in Efficiency Cost}$$

- Difference in Efficiency Cost:

$$\underbrace{\mathbb{E}_\theta \left\{ \left(\frac{dS^\theta}{d\Delta} - \frac{dS^\theta}{dq} \right) \left[T\left(z_1^\theta\right) - T\left(z_0^\theta\right) \right] \right\}}_{\text{efficiency cost of movers, on net} < 0}$$

$$- \underbrace{\mathbb{E}\left\{ T'(z)\, \rho'(z)\, \mathbb{E}\left[\frac{Z_c(\theta, j)}{1 + Z_c(\theta, j)\, T''(z)} | z_j^\theta = z \right] \right\}}_{\text{labor supply of stayers distorted by income tax} < 0}$$

  - Efficiency cost of tax reform: $\tilde{T}(z)$ is *progressive* when high income sort in 0 ($\rho'(z) < 0$)

→ Induces households to work less

PBR Desirability on Top of Optimal Income Tax is a Horserace

- **Proposition**. Place-based redistribution is desirable in the presence of an optimally chosen income tax iff:

$$\underbrace{\mathbb{E}_z\left[cov\left(\lambda^h, j^h | z^h\right)\right]}_{\text{PBR-specific equity benefit}} > \underbrace{\mathbb{E}_\theta\left\{\left(\frac{dS^\theta}{d\Delta} - \frac{dS^\theta}{dq}\right)\left[T\left(z_0^\theta\right) - T\left(z_1^\theta\right)\right]\right\}}_{\text{efficiency cost of movers}} + \underbrace{\mathbb{E}\left\{T'(z)\,\rho'(z)\,\mathbb{E}\left[\frac{Z_c(\theta, j)}{1 + Z_c(\theta, j)\,T''(z)} | z_j^\theta = z\right]\right\}}_{\text{labor supply of stayers distorted by income tax}}$$

- PBR is all the more desirable as
  - Place-based targeting provides specific equity gains
  - Migration rates are limited
  - Productivity differences of movers are limited
  - Labor supply responses are large

Roadmap

Calibration Exercise (preliminary)

- Two regions: Distressed = bottom 10% of CZ by average income; Elsewhere = top 90%
- Utility:

$$U^h(c,\ell,j) = \frac{\left(c - \frac{\ell^{1+\eta}}{1+\eta}\right)^{1-\gamma}}{1-\gamma} + a_j(\theta) + \varepsilon_j^h$$

- Calibration:
  - *Skill types*: 144 θ types, lognormal+Pareto density [Mankiw-Weinzierl-Yagan '09]
  - *Productivity advantage of Elsewhere*: $\frac{\Theta_0 - \Theta_1}{\Theta_1} = 10\%$ [Glaeser-Mare '01, BaumSnow-Pavan '11, Autor '19]
  - *Skill-taste correlation*: calibrated to match income sorting (earnings distribution in 0 and 1)
  - *Rent*: set for approx. 20% budget shares [Baum-Snow-Pavan '11]
  - *Elasticities:* Migration=1 (ε_j^h logit). Labor supply=0.5. $\gamma = 2$. [Kleven et al. '19, Kleven et al. '09]

Social Welfare Maximization

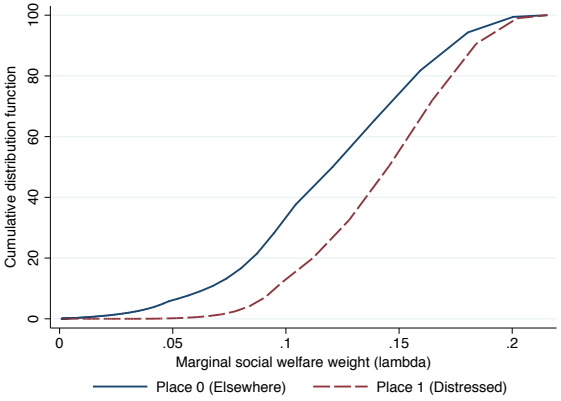
- Utilitarian planner maximizes. $SWF = \mathbb{E}\left[v^h\right]$, using jointly
  1. A place-blind income tax schedule chosen optimally
  2. A PBR chosen optimally

- Preliminary Findings
  - Optimum reached at $\tilde{\Delta}^* = \$1,550$ net lump-sum transfer to each Distressed resident
  - Welfare gains equivalent to lump-sum gain of $+\$134$ for all Americans

- Better targeting (CZ $\rightarrow$ Census Tract; non lump-sum PBR) likely to have larger welfare impact

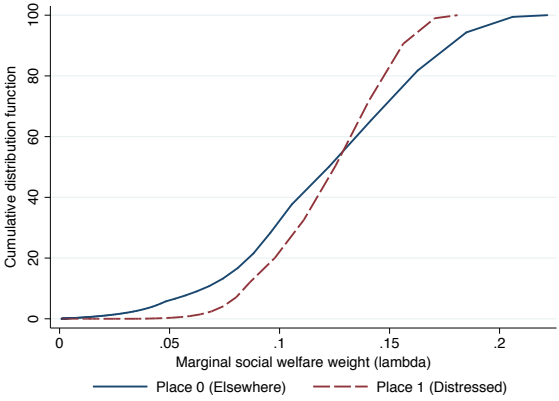
Intuition: PBR Alleviates Poverty in Distressed

- Distribution of marginal social welfare weights λ at $\tilde{\Delta} = \$0$



Intuition: PBR Alleviates Poverty in Distressed

- Distribution of marginal social welfare weights λ at $\tilde{\Delta}^* = \$1550$



Conclusion

- This paper: Place-based transfers can deliver unique *equity benefits*
  - Different rationale for place-based policy, beyond correcting market failures
- Simple lump-sum scheme. Alternative: index income tax on place
- Desirability is a quantitative question
- **No Presumption Against Helping Poor Places**