The End of the American Dream? Inequality and Segregation in US Cities

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Question

- over last 40 years large increase in US income inequality
- simultaneous rise in residential income segregation

Question:

has residential segregation contributed to amplify inequality response to underlying shocks?

This paper:

model of human capital accumulation and local spillovers disciplined with new micro estimates by Chetty-Hendren

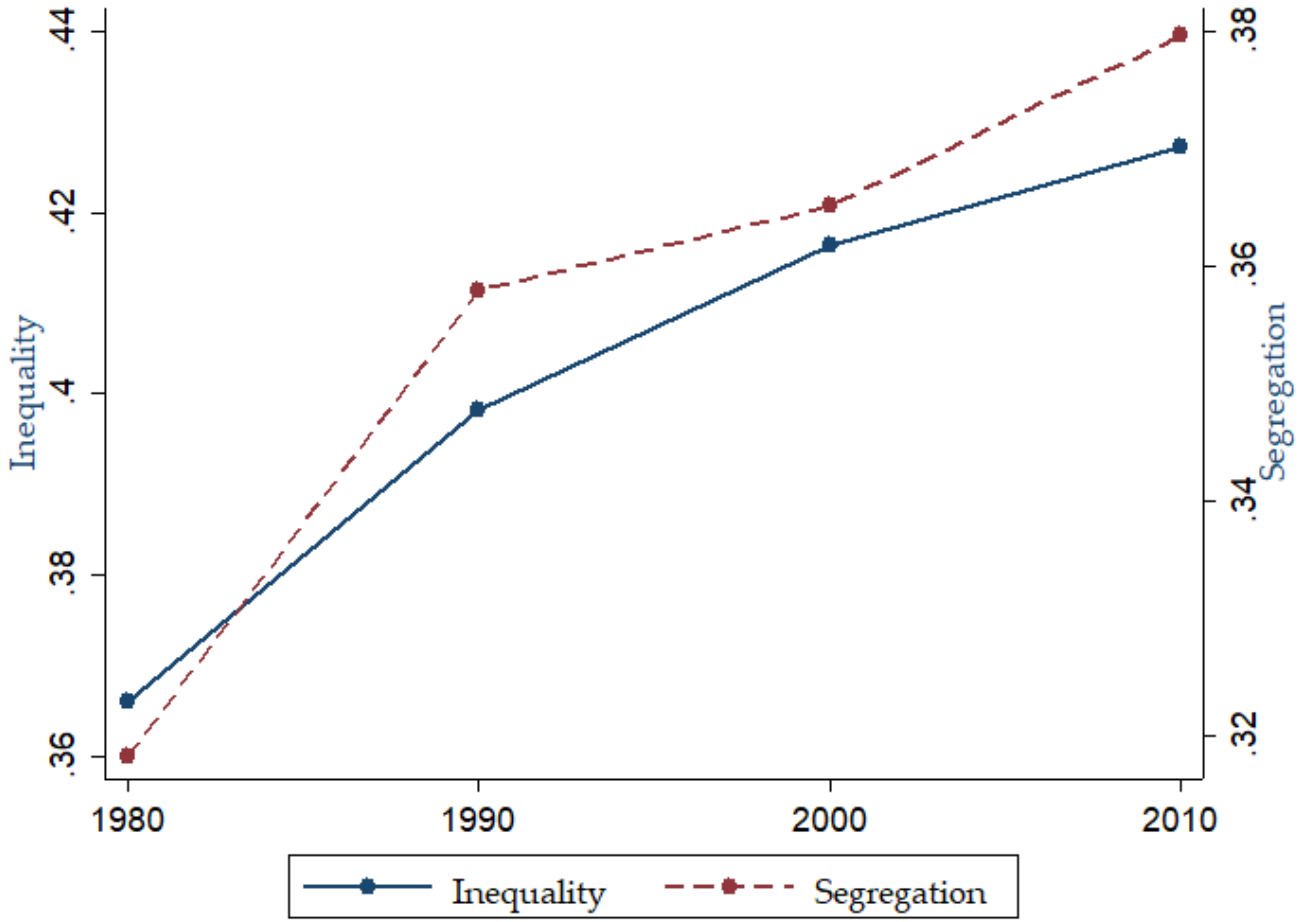
Some Literature

- 90s theoretical work on inequality and local externalities: Benabou (1996a,1996b), Durlauf (1996a,1996b), Fernandez and Rogerson (1996,1998),. . .
- recent use of administrative data: Chetty, Hendren and Katz (2016) and Chetty et Hendren (2018) estimate effects of childhood exposure to better neighborhoods
- we bridge the two literatures and use recent micro estimates to discipline a quantitative GE model
- new active area of research: Durlauf and Seshadri (2017), Zheng (2017), Eckert and Kleineberg (2018)

Preview

- data: correlation between inequality and segregation
- GE OGM with human K and residential choice
- key ingredient: neighborhood spillover
  - peer effects, public schools, social norms, learning . . .
- endogenous response of house prices $\rightarrow$ feedback between inequality and segregation
- calibrate the model to a representative US MSA
- **main exercise**: MIT shock to skill premium in 1980
- segregation contributes to 28% of the increase in inequality

Inequality and Segregation Across Time



Inequality and Segregation Across Space and Time

Set Up

- overlapping generations of agents who live for 2 periods: children and parents
- a parent at time t:
  - earns a wage $w_t \in [\underline{w}, \overline{w}]$
  - has a child with ability $a_t \in [\underline{a}, \overline{a}]$
- assume $log(a)$ follows an AR1 process with correlation ρ
- $F_t(w, a)$ = joint distribution of w and a at time t

Geography and Housing Market

- two neighborhoods: $n \in \{A, B\}$
- each agent live in a house of same size and quality
- R_t^n = rent in neighborhood n at time t
- extreme assumptions on supply:
  - fixed supply H in neighborhood A;
  - fully elastic supply of houses in neighborhood B;
- marginal cost of construction in B = 0 $\Rightarrow R_t^B = 0$ for all t

Education and Wage Dynamics

- parents can directly invest in education $e \in \{e_L, e_H\}$
- cost of $e_L = 0$, cost of $e_H = \tau$
- wage of child with ability a_t, education e, growing up in n:

$$w_{t+1} = \Omega(w_t, a_t, e, S_t^n, \varepsilon_t)$$

where ε_t is iid noise and S_t^n is neighborhood n spillover

- S_t^n = average human capital in neighborhood n at time t

$$S_t^n = E[w_{t+1}(w, a, \varepsilon) | n_t(w, a) = n]$$

Parents' Optimization Problem

parent (w_t, a_t) at time t solves

$$\begin{aligned} U(w_t, a_t) &= \max_{c_t, e_t, n_t} u(c_t) + E_t[g(w_{t+1})] \\ s.t. \quad & c_t + R_t^{n_t} + \tau e_t \leq w_t \\ & w_{t+1} = \Omega(w_t, a_t, e_t, S_t^{n_t}, \varepsilon_t) \end{aligned}$$

taking as given R_t^k and S_t^k for $k = A, B$

Equilibrium

For given $F_0(w,a)$, an equilibrium is a sequence $\{n_t(w,a), e_t(w,a), R_t^A, S_t^A, S_t^B, F_t(w,a)\}_t$ satisfying

- **agents optimization**: for any t given R_t^A, S_t^A, S_t^B
- **spillover consistency** for any t and $k = A, B$
- **housing market clearing**: for any t

$$H = \int \int_{n_t(w,a)=A} F_t(w,a) dwda$$

- **wage dynamics**: for any t

$$w_{t+1}(w,a,\varepsilon) = \Omega\left(w, a, e_t(w,a), S_t^{n_t(w,a)}, \varepsilon\right)$$

Assumptions

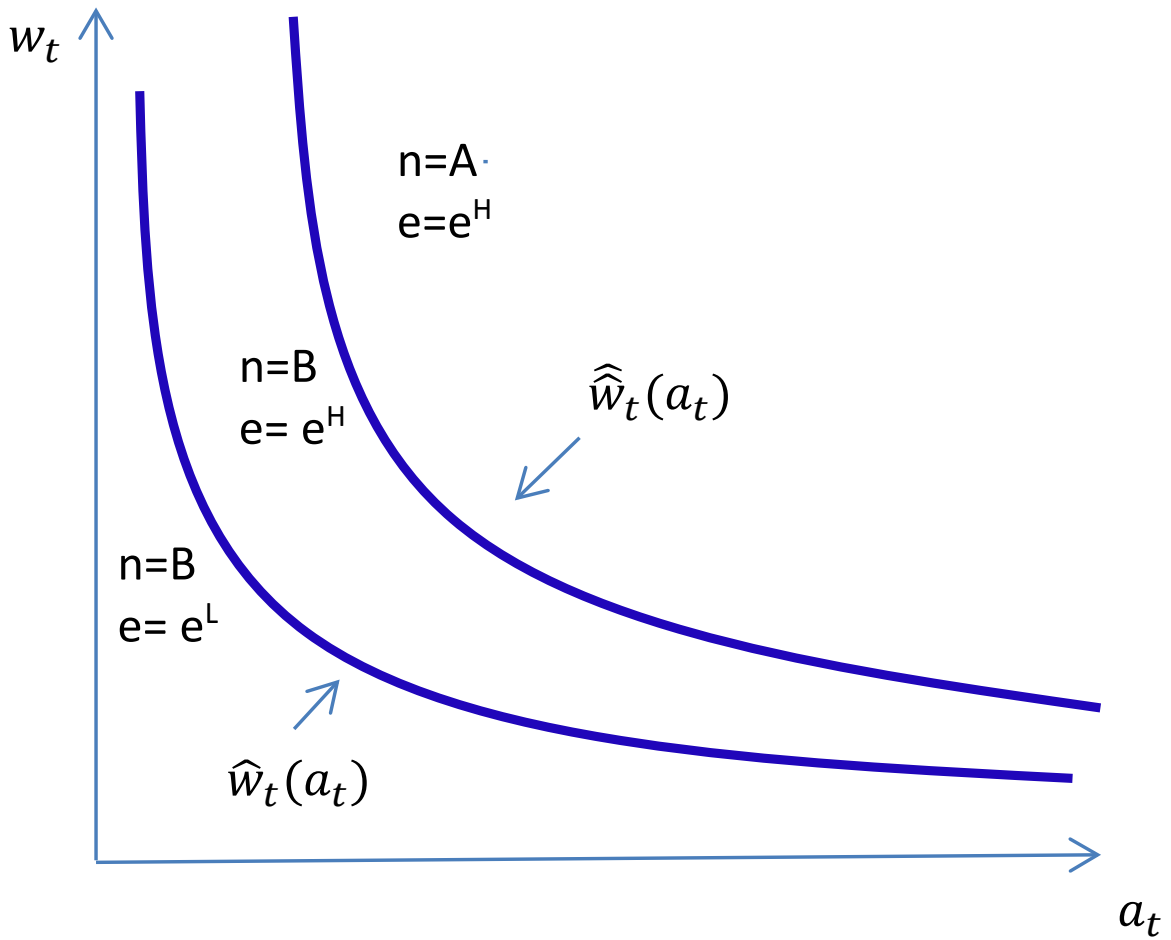
Focus on equilibria with $R_t^A > 0$ for all t $\Rightarrow$ $S_t^A > S_t^B$ for all t

Assumption A1
The function $\Omega(a, e, S, \varepsilon)$ is

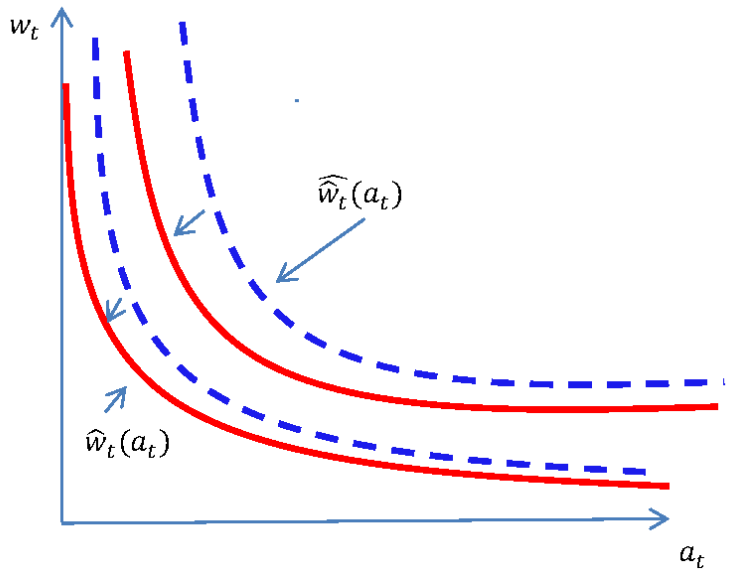
- constant in S and a if $e = e_L$
- increasing in S and a if $e = e_H$

Assumption A2
The composite function $g(\Omega(a, e, S, \varepsilon))$ has increasing differences in a and S, a and e, w and S, and w and e

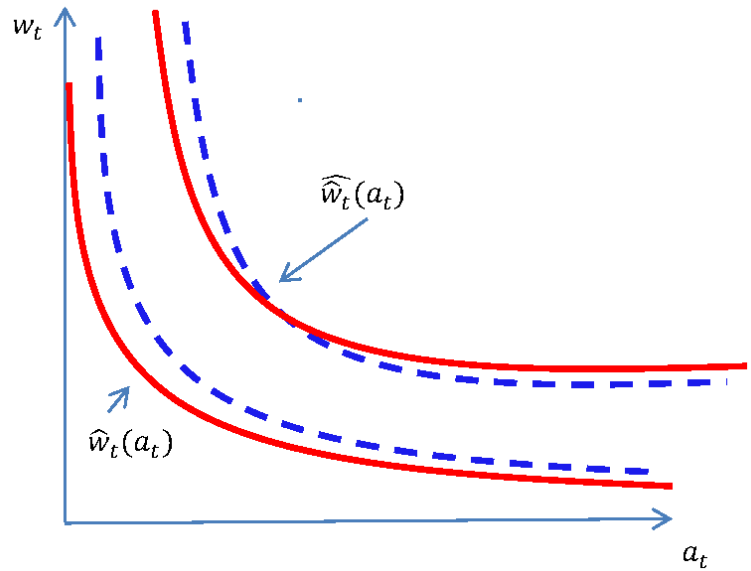
Cut-Off Characterization



Response to Skill Premium Shock



(a) Partial Equilibrium



(b) General Equilibrium

$$\Omega(w, a, e, S^n, \varepsilon) = (b + ea\eta(\beta_0 + \beta_1 S_n^{\xi}))w^{\alpha}\varepsilon$$

Extended Model

Two new ingredients:

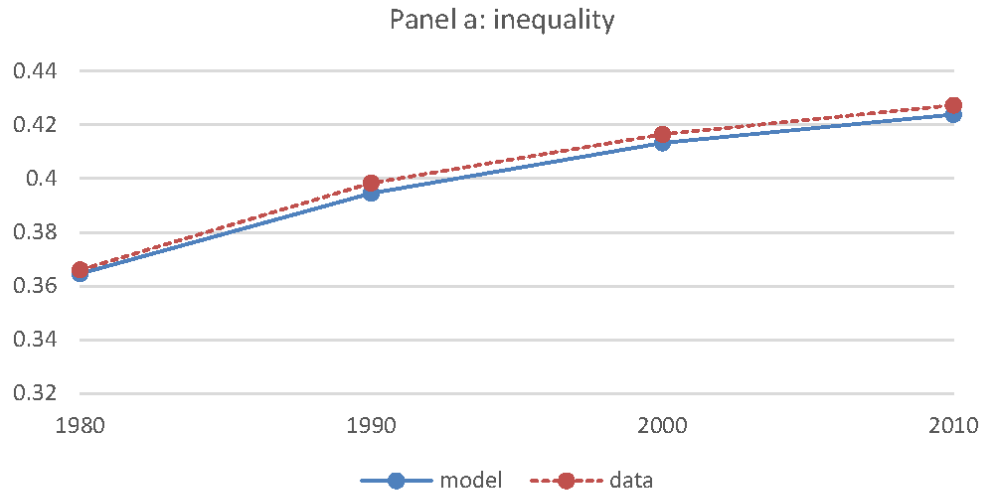
1. **continuous educational choice**:
   - higher dispersion in investment in human capital
2. **residential preference shock**:
   - this generates more mixing in the initial steady state

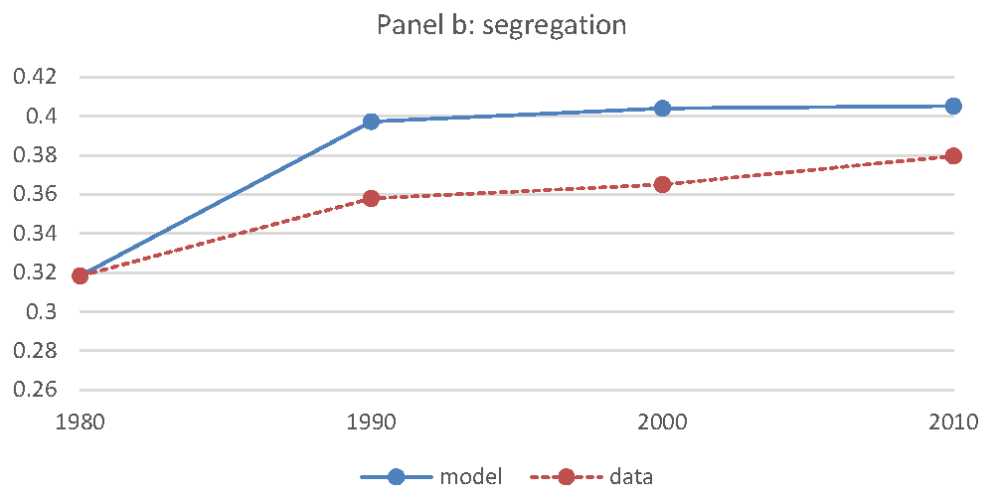
Calibration

Table 1: *Calibration Targets*

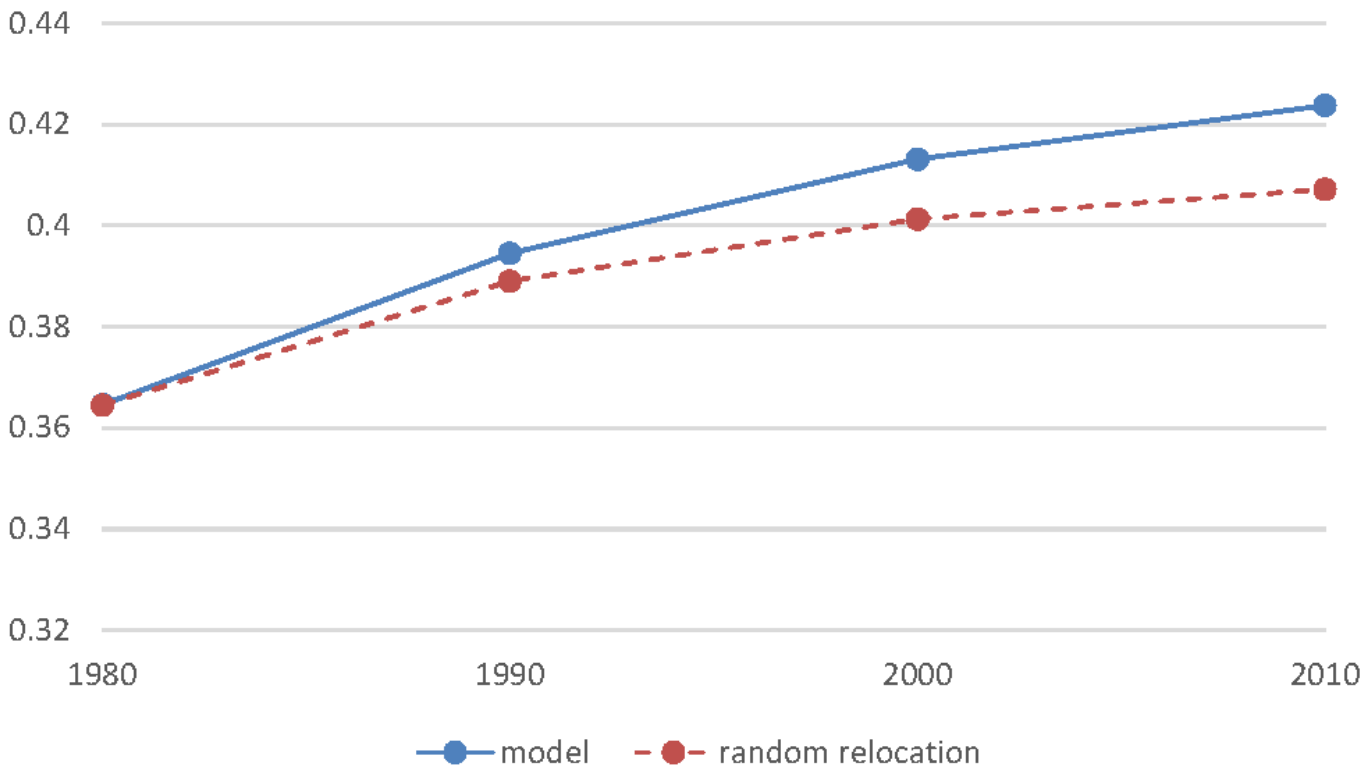
Description	Data	Model	Source
Gini coefficient	0.366	0.365	Census 1980, family income
Dissimilarity index	0.318	0.318	Census 1980, family income
H^R index	0.100	0.094	Census 1980, family income
B/A average income	0.516	0.459	Census 1980
R^A-R^B normalized	0.073	0.074	Census 1980
Rank-rank correlation	0.341	0.330	Chetty et al. (2014)
Return to spillover 25th p	0.104	0.104	Chetty and Hendren (2018b)
Return to spillover 75th p	0.064	0.070	Chetty and Hendren (2018b)
Return to college 1980	0.304	0.306	Valletta (2018)
Return to college 1990	0.449	0.449	Valletta (2018)

Response to Skill Premium Shock

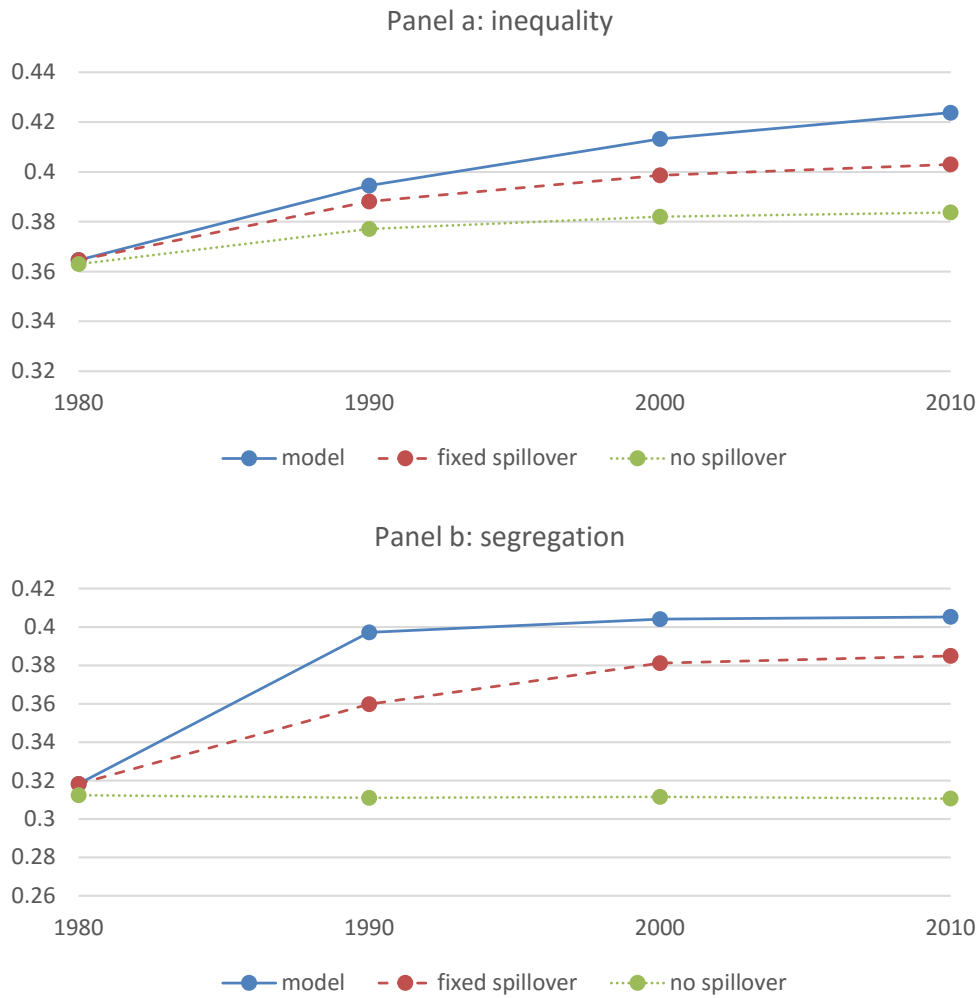




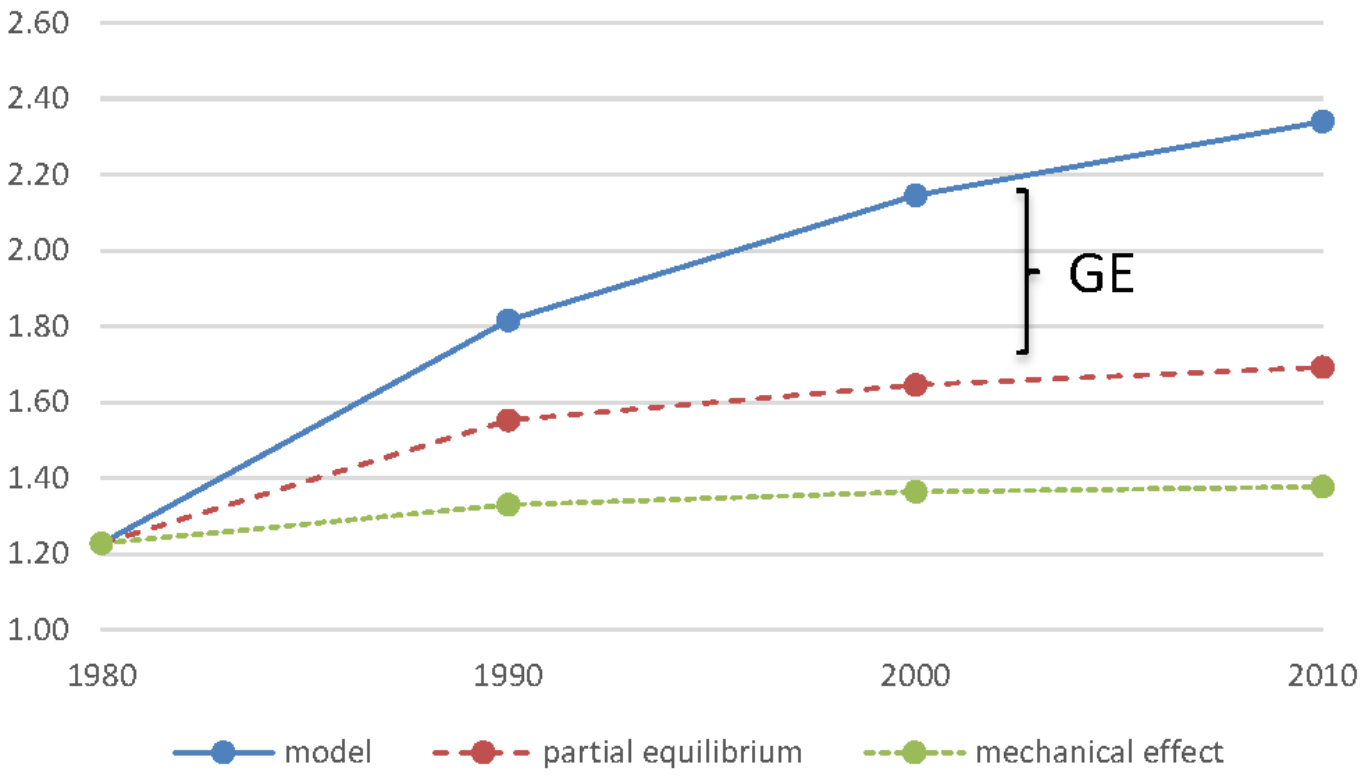
Main Counterfactual: Random Re-Location



No Spillover and No Spillover Feedback



Decomposing the Spillover Feedback



GE effect: as R^A increases, the degree of sorting by income increases

To conclude

- GE model with human capital accumulation, residential choice and local externalities
- local externalities generate segregation by income across neighborhoods
- segregation contributed to roughly 28% of the increase in inequality in response to a skill premium shock
- for the future:
  - use the model to think about differential response of inequality and segregation across metros
  - normative analysis