

Segregation and Residential Location Patterns

Urban Economics

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Residential Location Patterns

- ▶ Recent research has shown that the neighborhood where people live has important implications for short-run, long-run and even intergenerational outcomes.
- ▶ Residential choice can be driven by multiple factors:
 - ▶ Neighborhood/Housing/Amenities preferences
 - ▶ Racial discrimination
 - ▶ Others: Disparities in income, Information, Taxes/subsidies, Labor market opportunities, etc...
- ▶ Many suspect that ghettos cause these bad outcomes (at least in part)
- ▶ Moreover this might have great relevance for policy, especially if we believe (as per Schelling) that ghettoization reflects a coordination failure where the collective outcome is often not representative of the preferences of the median neighborhood dweller.

Schelling Tipping model

- ▶ What is distinctive is we may see a neighborhoods that exhibit locally stable ranges of integration.
- ▶ But a small perturbation to the neighborhood mix may produce a movement towards a fully segregated equilibrium.
- ▶ Thus, these models exhibit 'tipping.'
- ▶ In general, greater tolerance does not lead to greater chances of tipping.
- ▶ However, having a relatively larger population of one group does lead to a greater chance of tipping.
- ▶ Another important feature of the model is that the equilibrium does not appear to particularly maximize anyone's preferences or well-being.

Schelling Tipping model

Equilibrium Dynamics in Tipping Model

- ▶ The equilibria has the characteristic in that the preferences of a single individual can lead an entire neighborhood to unravel.
- ▶ In this sense, preferences act more like constraints on the problem rather than maximands of the invisible hand.
- ▶ Not coincidentally, preferences are written in this model as *willingness to tolerate* given neighbors rather than *desire* to have given neighbors.

Schelling Tipping model

Limitations of the Tipping Model

- ▶ The tipping model has two key limitations.
- ▶ First, there are no prices.
- ▶ Second, there is no forward-looking behavior.
 - ▶ One suspects that part of the tipping phenomenon (if it exists) is likely to be driven by *fear* of one group or the other that the neighborhood may tip—which makes them want to exit before property values fall.

Schelling Tipping model

Card, Mas and Rothstein (2008)

- ▶ However, before CMR (2008) there was no direct evidence of the tipping behavior
- ▶ The Card, Mas and Rothstein (2008) paper introduces a version of the Schelling model that incorporates prices and provides evidence on the relevance of the tipping phenomenon.
- ▶ This gives nice (and empirically relevant) predictions on the differential reaction of homeowners versus home-renters to changes in neighborhood racial composition.

Tipping And The Dynamics Of Segregation

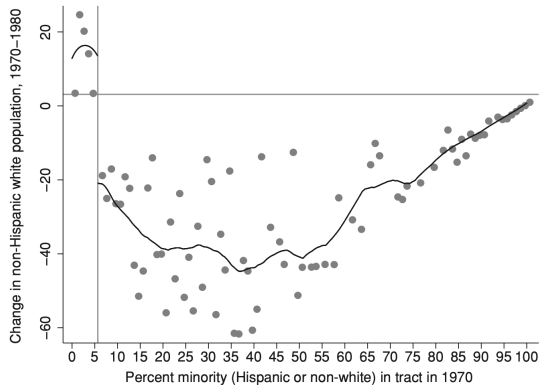


FIGURE I
Neighborhood Change in Chicago, 1970-1980

Source: Card et al. (2016) Tipping And The Dynamics Of Segregation

Tipping And The Dynamics Of Segregation

Model

- ▶ Two groups of buyers: $g \in w, m$
- ▶ These are willing to pay at least:

$$b^g(n^g, m) \tag{1}$$

- ▶ $\frac{\partial b^w}{\partial n^w}$ and $\frac{\partial b^m}{\partial n^m}$ weakly negative
- ▶ $\frac{\partial b^w}{\partial m}$ and $\frac{\partial b^m}{\partial m}$ social interaction effects.

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Model

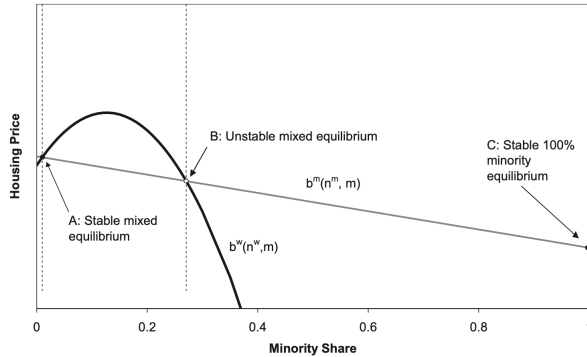
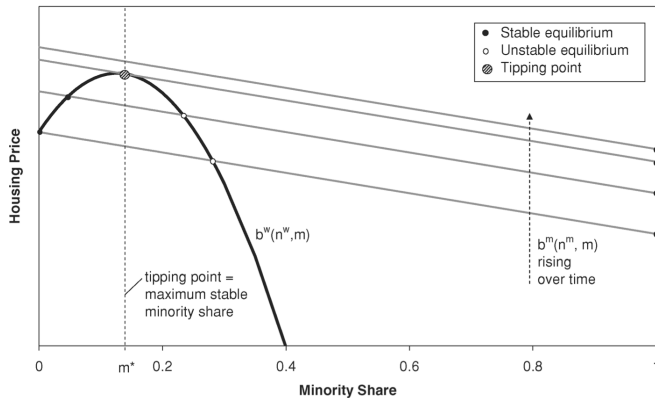


FIGURE II
Three Equilibria

Source: Card et al. (2016) Tipping And The Dynamics Of Segregation

Tipping And The Dynamics Of Segregation

Model



Source: Card et al. (2016) Tipping And The Dynamics Of Segregation

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Equations for Tipping Model Identification

► At $m_{t-1} < m^*$

$$E[\Delta m_t | m_{t-1}] = g(m_{t-1}),$$

► For $m_{t-1} \geq m^*$:

$$E[\Delta m_t | m_{t-1}] = h(m_{t-1})$$

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Equations for Tipping Model Identification

- For the intermediate range $m_{t-1} \in [m^* - r, m^*]$ where tipping is possible but uncertain:

$$E[\Delta m_t | m_{t-1}] \approx 1[m_{t-1} < m^*] g(m_{t-1}) + 1[m_{t-1} \geq m^*] h(m_{t-1}).$$

- Discontinuity condition at m^* :

$$\lim_{\epsilon \rightarrow 0^+} [h(m^* + \epsilon) - g(m^* - \epsilon)] > 0.$$

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Empirical Specification

$$D_{wic,t} = p(\delta_{ic,t-10}) + d1[d_{ic,t-10} > 0] + \tau_c + X_{ic,t-10}\beta + \epsilon_{ic,t}.$$

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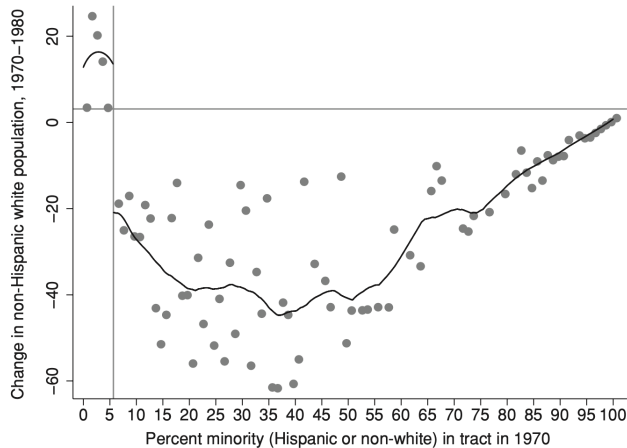
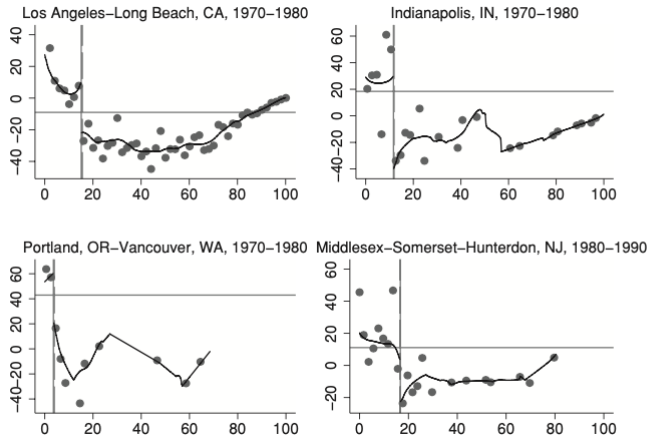


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Neighborhood Change in Chicago, 1970-1980

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TABLE II
OVERVIEW OF CANDIDATE TIPPING POINTS

	1970–1980		1980–1990		1990–2000	
	Fixed point method	Structural break method	Fixed point method	Structural break method	Fixed point method	Structural break method
	(1)	(2)	(3)	(4)	(5)	(6)
Mean	11.87	8.98	13.53	11.69	14.46	13.96
SD	9.51	8.78	10.19	8.23	9.00	9.68
# of MSAs in sample	104	104	113	113	114	114
# without identified points	4	—	3	—	0	—
Correlations						
1970–1980, fixed point	1.00					
1970–1980, structural break	0.55	1.00				
1980–1990, fixed point	0.46	0.45	1.00			
1980–1990, structural break	0.45	0.39	0.64	1.00		
1990–2000, fixed point	0.50	0.44	0.59	0.68	1.00	
1990–2000, structural break	0.45	0.61	0.58	0.73	0.73	1.00

Notes. Tipping points describe the minority share in the census tract, measured in percentage points. Summary statistics are unweighted. All candidate points are estimated using a two-thirds subsample of the original data.

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TABLE III
BASIC REGRESSION DISCONTINUITY MODELS FOR POPULATION CHANGES AROUND THE CANDIDATE TIPPING POINT

	Change in white population				Change in minority population		Change in total population	
	Pooled		Fully interacted		Pooled		Pooled	
	Fixed point	Struct. break	Fixed point	Struct. break	Fixed point	Struct. break	Fixed point	Struct. break
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1970–1980								
Beyond candidate tipping point in 1970	–12.1 (2.7)	–10.4 (3.4)	–14.2 (3.1)	–16.4 (4.3)	2.0 (1.0)	–0.1 (1.2)	–10.1 (3.0)	–10.4 (3.5)
Demographic/housing controls	y	y	n	n	y	y	y	y
<i>N</i>	11,611	11,886			11,611	11,886	11,611	11,886
<i>R</i> ²	0.25	0.25			0.22	0.22	0.23	0.24
1980–1990								
Beyond candidate tipping point in 1980	–13.6 (2.0)	–11.4 (3.5)	–17.0 (3.1)	–18.6 (3.5)	–1.1 (1.1)	0.3 (1.1)	–14.7 (2.6)	–11.1 (4.1)
<i>N</i>	12,151	13,067			12,151	13,067	12,151	13,067
<i>R</i> ²	0.30	0.30			0.26	0.26	0.29	0.29
1990–2000								
Beyond candidate tipping point in 1990	–7.3 (1.5)	–9.3 (1.8)	–3.6 (2.1)	–6.6 (2.0)	2.9 (1.1)	1.4 (0.8)	–4.3 (2.1)	–7.9 (2.2)
<i>N</i>	13,371	13,371			13,371	13,371	13,371	13,371
<i>R</i> ²	0.15	0.14			0.18	0.19	0.13	0.13

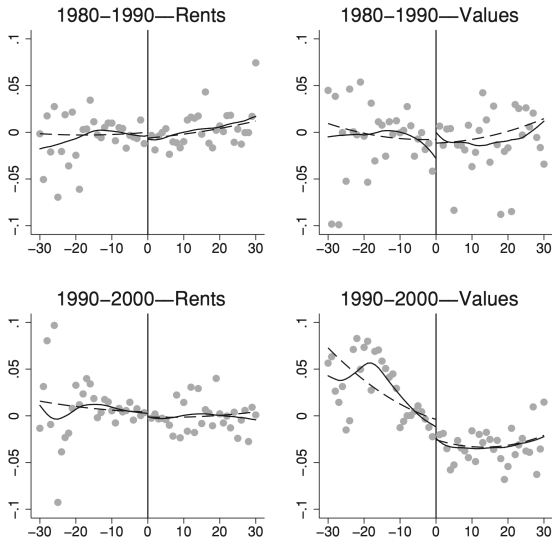
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TABLE IV
TIPPING IN THE 1990s, BY AMOUNT OF REMAINING UNDEVELOPED LAND

		Tipping discontinuity, 1990–2000			
	# of tracts	Change in white population	Change in minority population	Change in total population	Change in minority share
	(1)	(2)	(3)	(4)	(5)
Full sample	13,371	−7.3 (1.5)	2.9 (1.1)	−4.3 (2.1)	3.4 (0.4)
>91% developed	3,368	−4.7 (1.1)	4.7 (1.1)	0.0 (1.3)	4.6 (1.0)
<91% developed	9,875	−6.1 (1.8)	2.4 (1.3)	−3.7 (2.6)	2.5 (0.4)

Notes. See notes to Table III (columns (1), (5), and (7)) for details on sample and specifications. Fixed point candidate tipping points are used. Column (5) takes as the dependent variable the minority share in 2000 minus the minority share in 1990 but is otherwise identical. Developed land measure is computed from the National Land Cover Data: 91% is the 75th percentile of this measure. See text for details.

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Source: Card et al. (2016) Tipping And The Dynamics Of Segregation

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TABLE VIII
TIPPING IN ELEMENTARY SCHOOLS

	Tipping discontinuity, 1990–2000			
	Change in white population	Change in minority population	Change in total population	Change in minority share
	(1)	(2)	(3)	(4)
Beyond candidate tipping point	−7.4 (2.3)	0.9 (0.9)	−6.5 (2.3)	2.3 (0.8)
N	5,641	5,641	5,641	5,641

Note. Sample consists of elementary schools in the MSA. Tipping points are estimated using the fixed point method over a two-thirds subsample; the remaining one-third subsample is used to estimate the specifications shown here. Each includes a quartic polynomial in the minority share relative to the candidate tipping point, MSA fixed effects, and a control for the school free lunch share. Standard errors are clustered on the MSA.

Source: Card et al. (2016) Tipping And The Dynamics Of Segregation

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TABLE IX
MODELS FOR THE LOCATION OF THE TIPPING POINT

	Mean [SD]			
	(1)	(2)	(3)	(4)
	Coefficients (SEs)			
Race attitudes index	−0.1	−2.77	−2.98	−2.66
(positive = less tolerant)	[0.6]	(1.16)	(1.08)	(0.94)
% Black	11.4	0.53	0.59	0.81
	[8.6]	(0.10)	(0.10)	(0.10)
% Hispanic	6.7	0.65	0.75	0.94
	[9.9]	(0.07)	(0.07)	(0.09)

Source: Card et al. (2016) Tipping And The Dynamics Of Segregation