



# Exclusionary Policies in Urban Development: Brazil

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# Issues

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- Vast urban slums housing migrants in urbanizing countries
- What causes slums?
  - Is it more than a transition stage under low incomes?
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# Issues (continued)

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- Intentional (or, “strategic”)
  - “Exclude” migrants from favored cities
  - Favored cities of *national* govt.
    - Capital markets; import/export licenses, allocation of public services (high quality schools)
    - Jobs and services draw in migrants
    - Over-crowding of facilities, congestion
      - Ades and Glaeser, Davis and Henderson
    - (why favored?)
  - locals resist in-migration: make it unattractive
    - Force migrants into un-serviced slums
      - Sewer, water

# Issues (continued)

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- Current focus: sub-Sah. Africa, China, India
  - E.g., Beijing: “urban villages” vs. incorporate migrants into city
    - Explicit strategy to dampen population growth (Cai Fang, 2006)
    - Informal sector housing only, in un-serviced urban villages (utilities, schools...)
- Problems with the strategy:
  - Inequality; health
  - Cost of later catch-up
  - Generates negative externalities: could backfire
- Lessons of recent “past”: Brazil (1970-2000)

# Exclusion: USA literature

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- Traditional Tiebout: (Epple & Nechyba, 2004) and new “Super-star” cities (Gyourko, Mayer, Sinai (2006))
  - San Francisco (high amenities), slow growth of population; high growth of real housing prices
- Exclusion by zoning and other *formal* sector restrictions

# Exclusion: Developing countries differ

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- Zone formal sector      informal sector
- Informal sector is “permitted”
  - Favelas (invasions)
  - loteamentos (explicit development)
    - Brazil ‘79 national law: 125 sq m. min
- Not service informal sector
  - “illegal” to service prior to 1988
    - Sewer and water
  - 1988+ democratization
- Low income suburbs

# Plan of talk; preview of results

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- Distinguish (Census years)
  - Pre-democracy provision of services: 1980-1991
  - Post-democracy locality growth: 1991-2000
- 1. Background on Brazil urbanization
- 2. Servicing for migrants/low income households in 1991
  - 1980 conditions
  - Local elites exercise exclusion:
    - **Evidence of strategic elements?**
- 3. Effect of poor servicing on urban growth and population **composition** for '91-'00

# Data

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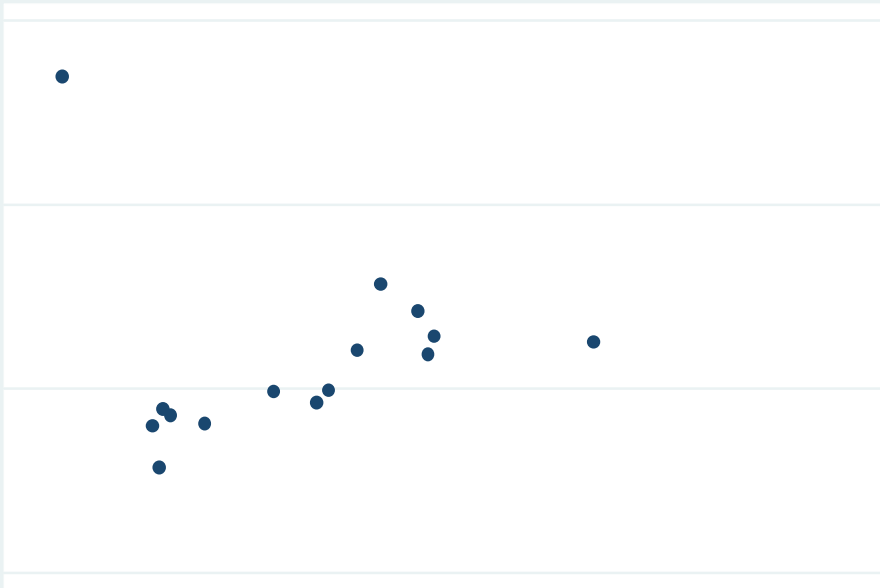
- '70, '80, '91, 00 censuses (long form)
  - Also geographic data (soils, climate, etc.)
  - 1999, 2005 urban yearbook
    - Retrospective data on land use regulations
    - But ex post info
- “locality” as unit of analysis.
  - Municipios      locality (definitions change over time)
  - 123 urban areas [UA] with 447 localities:
  - **59 UA's with multiple localities (383 in 2000)**



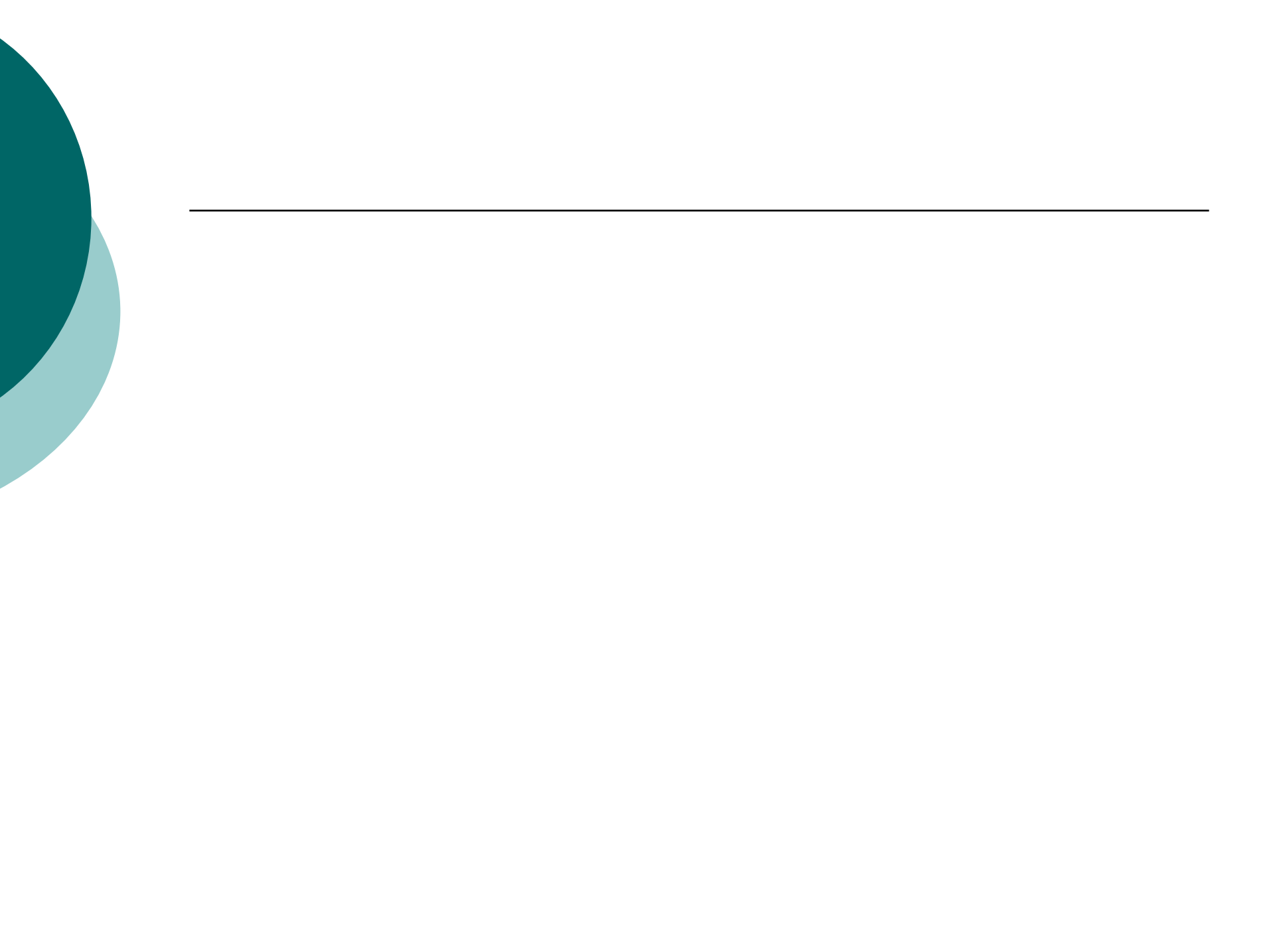
# Urban population growth in Brazil urban areas

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a) **Urban areas** [slope coefficient (standard error) of  $-.00644$  ( $.017$ );  $R^2=0$ ]







# Defining the informal sector

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- Census
  - “Irregular” configurations (<5%?)
  - No title to land (8% of home owners in 1991: perception?)
  - Infrastructure services (Dowall, 2006)
    - Central water connection
    - Full service (electricity, central water and sewer)
      - Highly valued from hedonic modeling

# Service levels: to whom?

**Table 2. Servicing of housing in Brazil in urban areas**

(All urban households living in localities over 50% urbanized & 10% service levels)

**a. All housing: over time provision; 1991 breakdown**

	Percent with central water connection	Percent with full service: electricity, water and central sewer	Share of housing	Number of localities Water [full service]
<b>1970 all</b>	59	41		226 [149]
<b>1980 all</b>	81	53		365 [214]
<b>1991 all</b>	<b>91</b>	<b>62</b>		428 [250]
<b>2000 all</b>	92	64		435 [359]
<b>1991 breakdown</b>				
<b>Own house, not land</b>	82	34	8.1	
<b>rent</b>	94	67	21	
<b>Migrants: bottom 20%</b>	81	43	3.9	
<b>Non-migrants: bot. 20%</b>	87	52	15	

Can't tell migrants where to live (vs. China):  
Therefore, under-service likely living quarters

# Servicing of small versus large houses

**Table 2. Servicing of housing in Brazil in urban areas (continued)**

All urban households living in localities over 50% urbanized & 10% service levels.

## **b. Services by house quality**

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<b>All urban housing in significant size MCA's</b>				
	<b>Percent with water</b>		<b>Percent with full service</b>	
	<b>1980</b>	<b>1991</b>	<b>1980</b>	<b>1991</b>
<b>Low quality housing: (15%)</b> 1-2 rms. 1980; 1-3 rms. 1991	61	81	17	32
<b>High quality housing: (20%)</b> 6-7 rms. 1980; 7-9 rms. 1991	86	95	54	64

# Determinants of servicing for small houses: Pre-democracy era

## 91 provision ( 80 conditions)

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- Focus on Water (locally supplied)
- Demand & supply:
  - median income (+);
  - scale: no. urban households (+)
  - geography (soil, rock, weather, rivers, density)
    - Efficacy of wells
  - institutions

# Evidence of strategic exclusion

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- Negative interaction: scale and income
  - Servicing of small houses: lower in richer, larger localities
- “Reaction” by rich to having more poor “nearby” (rest of UA)
- “Counterfactuals”
  - Not same patterns for servicing of larger houses
  - Not important in democratic era (2000 Census)



# Evidence on exclusion (quantifying interactive effects): **Servicing of small houses**

**Effect of changes in locality size and in % poor in rest of UA, at different locality median income levels**

	<b>Effect at <i>low</i> median income (1.5 s.d.'s below mean)</b>	<b>Effect at <i>high</i> median income (+1.5 s.d.'s above mean)</b>
<b>Large increase in size (1.5 s.d.'s below mean size to +1.5 s.d.'s above)</b>	<b>.09</b>	<b>-.11</b>
<b>Change in % poor, rest UA: from 1.5 s.d.'s below mean % poor to + 1.5 s.d.'s above</b>	<b>.27</b>	<b>-.13</b>

a. Log median income at 1.5 standard deviations below the mean is 8.93 and at 1.5 standard deviations above is 10.1. Log number of households at 1.5 standard deviations below the mean is 7.2 and at 1.5 standard deviations above is 11.4. Percent poor in rest of urban area at 1.5 standard deviations below the mean is .01 and at 1.5 standard deviations above is .42.

# Growth and composition: 91-00 (on 91 covariates)

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## Growth

- Urban growth framework (de Mata et al., 2007)
- Applied to **within** urban area differences in locality growth
  - **R**: "Regulation": **lack** of service to **small** houses
  - Control locality characteristics, UA fixed effects

$$d \ln(N_{i,t}) = \beta X_{i,t-1} + \gamma R_{i,t-1} + \varepsilon_{it}$$

## Identification

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- Catch-up problem: growth associated with slow provision
  - Instrument: geology and weather

# Table 7. Urban growth effects ('91-'00): Share of small houses with no water ('91)

<b>Econometric estimates: growth rate in no. of households</b>		
	<b>OLS</b>	<b>IV (2SLS)</b>
<b>R: Share small houses <b>no</b> water 1991</b>	<b>.053</b>	<b>-.642**</b>
Locality avg. education, Ln (no. urban h.h's) Ln (land area), Share h.h's rural in locality, Economic shock 1991-2000, urban area fixed effects	yes	yes
N	353	355

# Composition '91-'00

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Two groups: **L**ow education: h.h. head not finish primary school [vs. **H**igher]: 45-55% split in '91

Growth of low education **relative** to higher education, based on **relative** service levels

$$d \ln(N_{ij,t}^L) - d \ln(N_{ij,t}^H) = \gamma \ln(R_{ij,t-1}^L / R_{ij,t-1}^H) \\ + \beta_0 \ln(N_{ij,t-1}^L / N_{ij,t-1}^H) + \beta_2 \ln(\text{density}_{ij}) + \varepsilon_{ijt}$$

*i* locality, *j* UA

Change in income Gini

# Econometric results

<b>Growth in low relative to high educ. h.h.'s</b>		
	<b>OLS</b>	<b>2SLS</b>
<b>R: Ln (share small houses/ share large houses, without water, '91)</b>	<b>-.060**</b> (.024)	<b>-.174**</b> (.082)
<b>Controls: Ln (# low educ /# higher educ), ln(density) 1991</b>	yes	yes
<b>Urban area fixed effects</b>	no	yes
<b>N [clusters= 58]</b>	334	331

<b>Change in Gini 00-91</b>		
	<b>OLS</b>	<b>2SLS</b>
<b>Ln ( share small/large houses, no water)</b>	<b>.0050**</b>	<b>.017**</b>
<b>Controls: UA fixed effects, Gini 91</b>	yes	yes



# Magnitude of Effects

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A one standard deviation increase in **relative** lack of servicing (lack of



# Conclusions

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- Evidence consistent with hypothesis of exclusionary behavior
  - in the non-democratic 1980's, Brazilian localities acted to strategically under-serve smaller houses (intended for migrants)