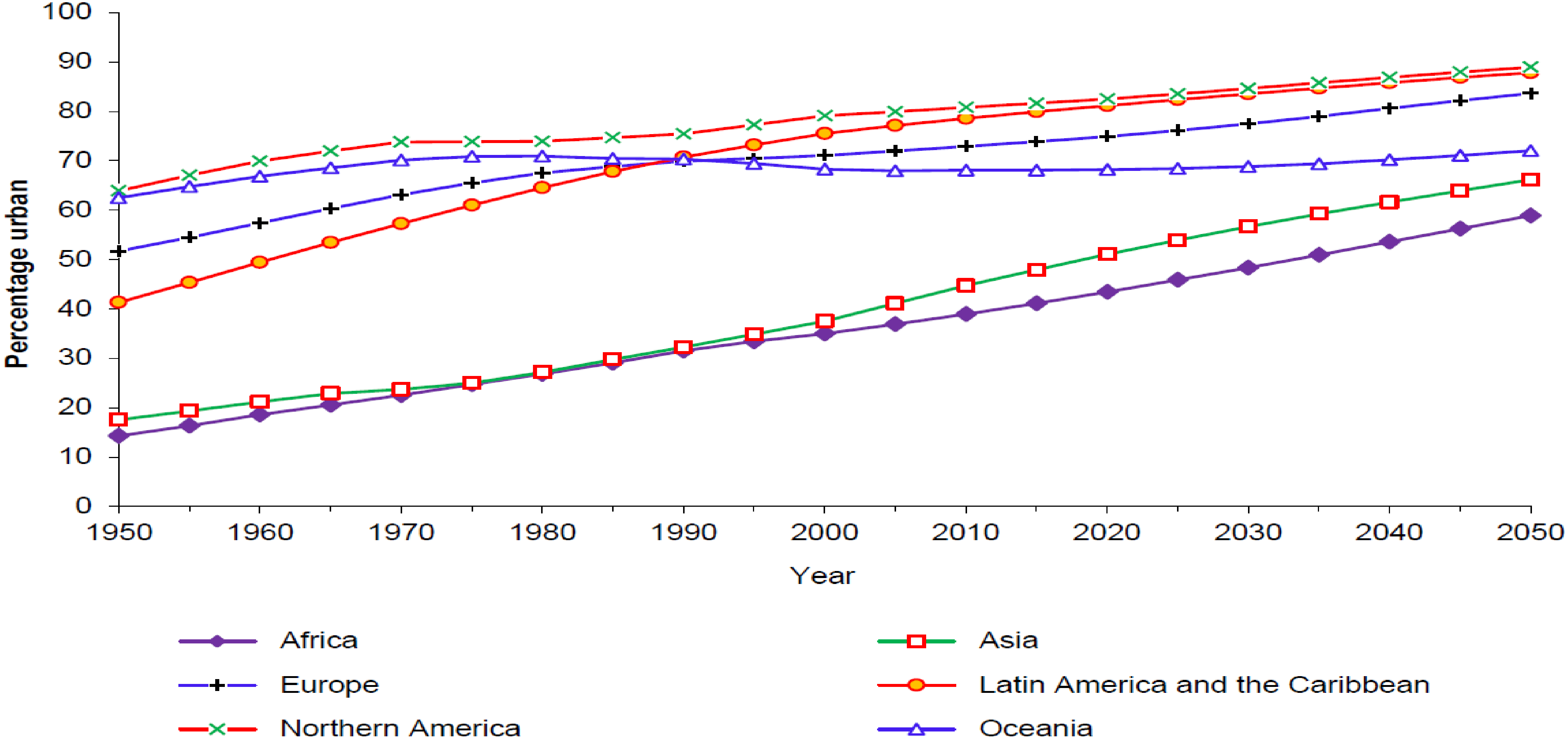
**Figure I.11. Percentage of population residing in urban areas by geographic region, 1950-2050**




Source: UN World Urbanization Prospects, 2018

# The Urban Triad

The Economic Magic of Human Interaction by חדוה שנדרוביץ


Government battling the Demons of Density


The Physical City by rulto

# An Urban Agenda for the Developing World

- The Agglomeration Side
  - Diego will primarily cover this but I will say a little about one important question.
- The Downsides of Urban Life
  - Crime and contagious disease
  - Infrastructure, incentives and institutions
  - The new transportation models (Heblich, Redding, Sturm, Tsivanidis, Allen, Arkolides)
- The physical city
  - Housing costs and public housing
  - Roads and roughness
- Climate Change relates to all of this and protecting the cities of the developing world from climate change is one of the big agendas of the 21$^{st}$ century.

# Are cities poverty traps or opportunity escalators?

- Janice Perlman (Favela) vs. Marx, Stoker and Suri (The Economics of Slums, JEP)

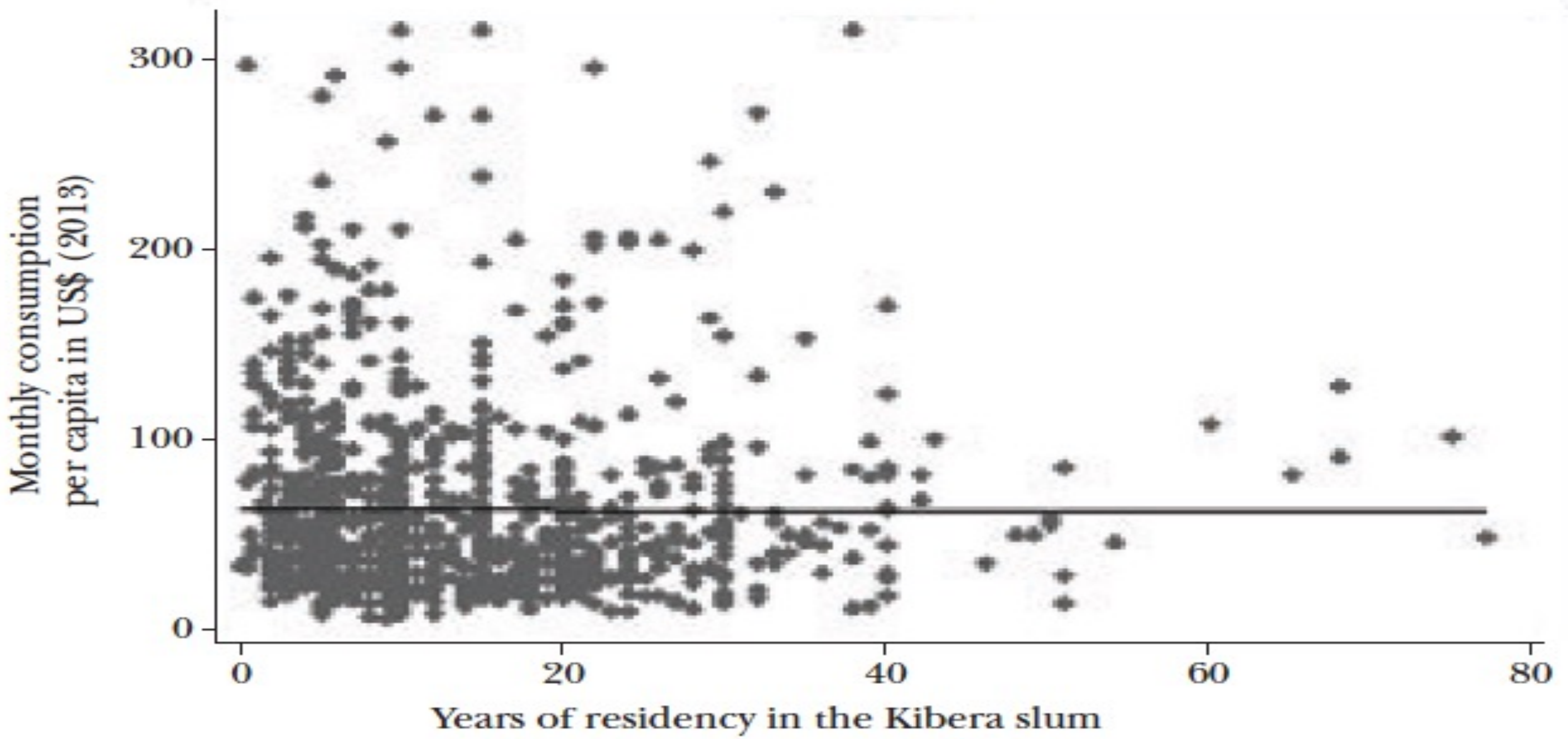
- Upward Mobility in Brazilian Cities and Workplace segregation (joint with Carlo Ratti, Radu Barzu, Martina Viarengo)

- The learning model and Yulu Tang's job market paper

- Gender and the City: segregation and rule of law in Zambia (joint with Nava Ashraf and Alexia Delfino)

# Marx, Stoker, Suri → A Cross-section

A: Kenya



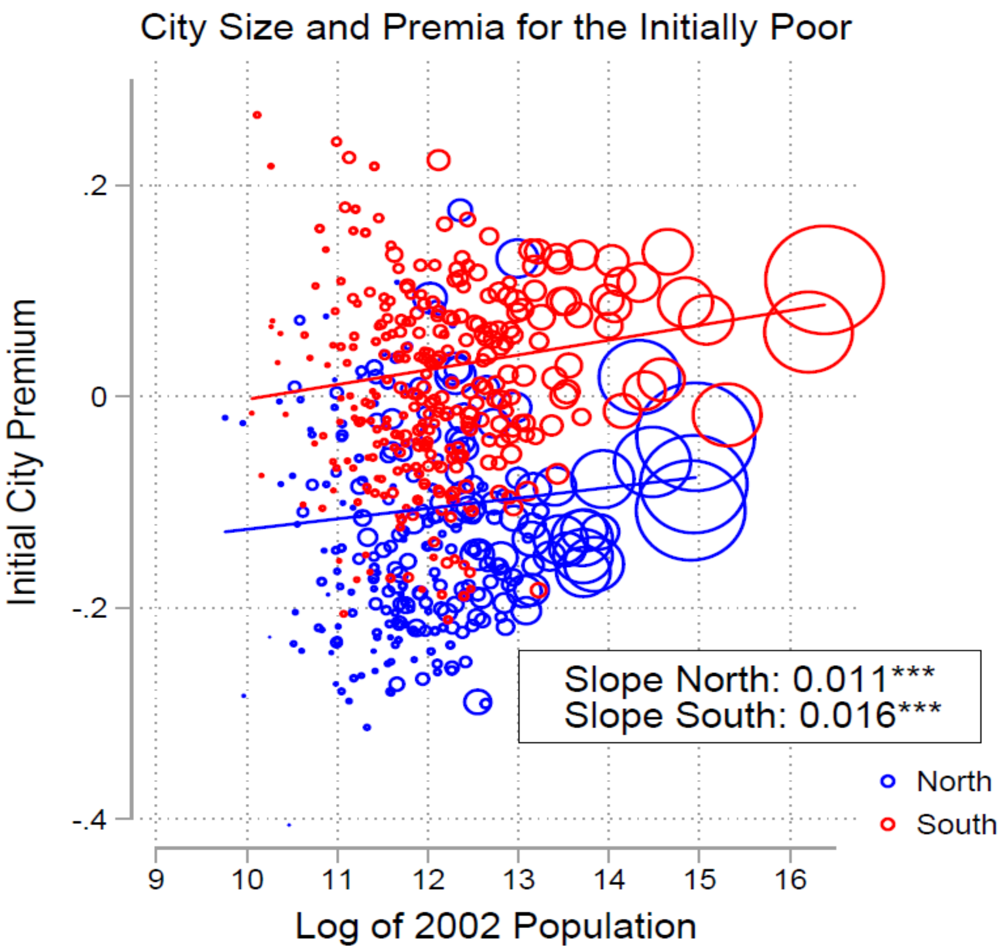
Vidigal (Rio de Janeiro) by Chengsiyuan

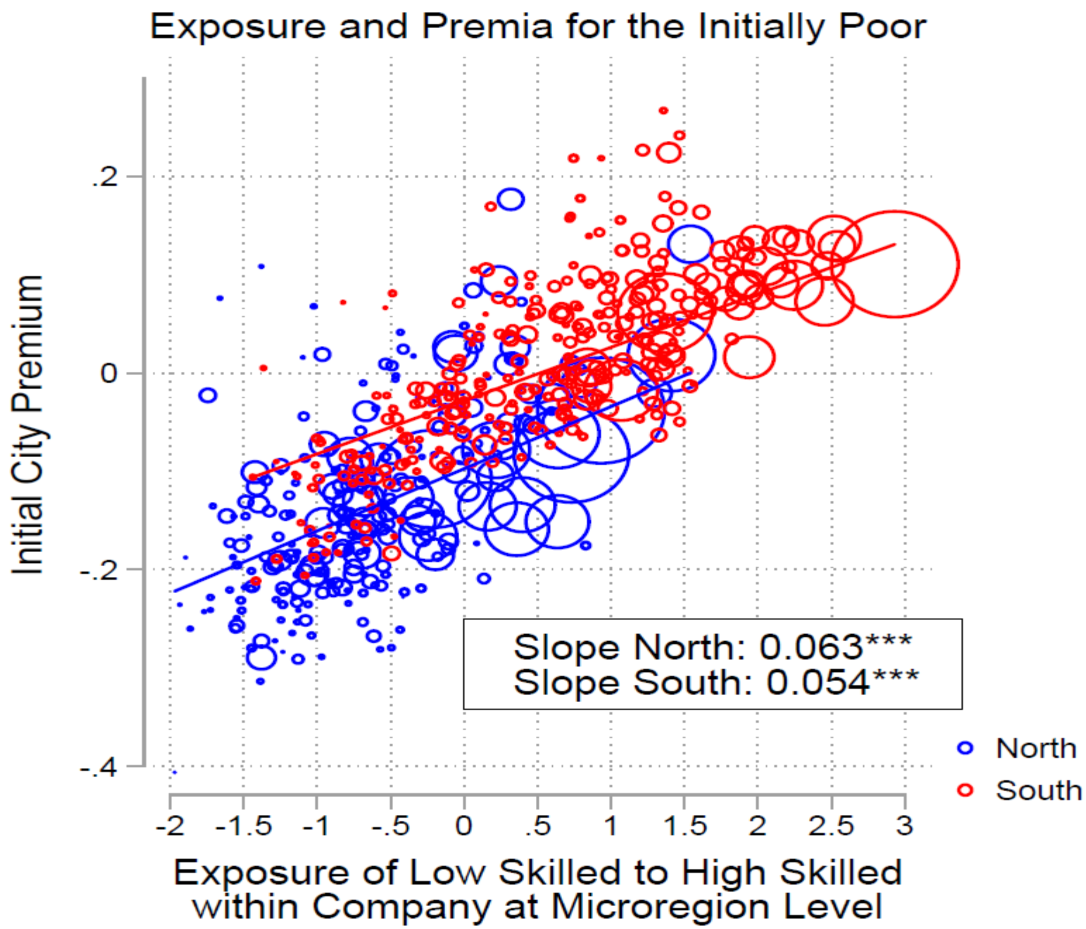
TABLE 9.2 *Living Standards, 1969 and 2001, Comparing Three Generations (%)*

| | *1969 Original Interviewees* | *2001 Original Interviewees* | *2001 Children* | *2001 Grandchildren* |
|---|---|---|---|---|
| Brick home | 43 | 94 | 97 | 97 |
| Indoor plumbing | 54 | 76 | 98 | 99 |
| Electricity | 73 | 98 | 97 | 96 |
| Refrigerator | 36 | 98 | 97 | 96 |
| Television | 27 | 93 | 98 | 96 |
| Washing machine | 0 | 50 | 67 | 63 |
| Air conditioner | 0 | 39 | 69 | 68 |
| Telephone line | | 68 | 88 | 89 |
| Car | 0 | 14 | 29 | 34 |
| Computer | 0 | 10 | 22 | 25 |
| Illiteracy | 72 | 45 | 6 | 0 |
| Some/all high school | 0 | 1 | 29 | 45 |
| Mean # of years of education | 2.37 | 2.49 | 7.36 | 8.88 |
| Nonmanual job (as job held for longest period in life) | 6 | 20 | 37 | 61 |

*Note*: Impressive gains were shown in housing infrastructure, electro-domestic consumer items, education, and occupation.

# City Size and Wages (holding individual fixed)



# Yulu Tang’s work on migrants in clusters

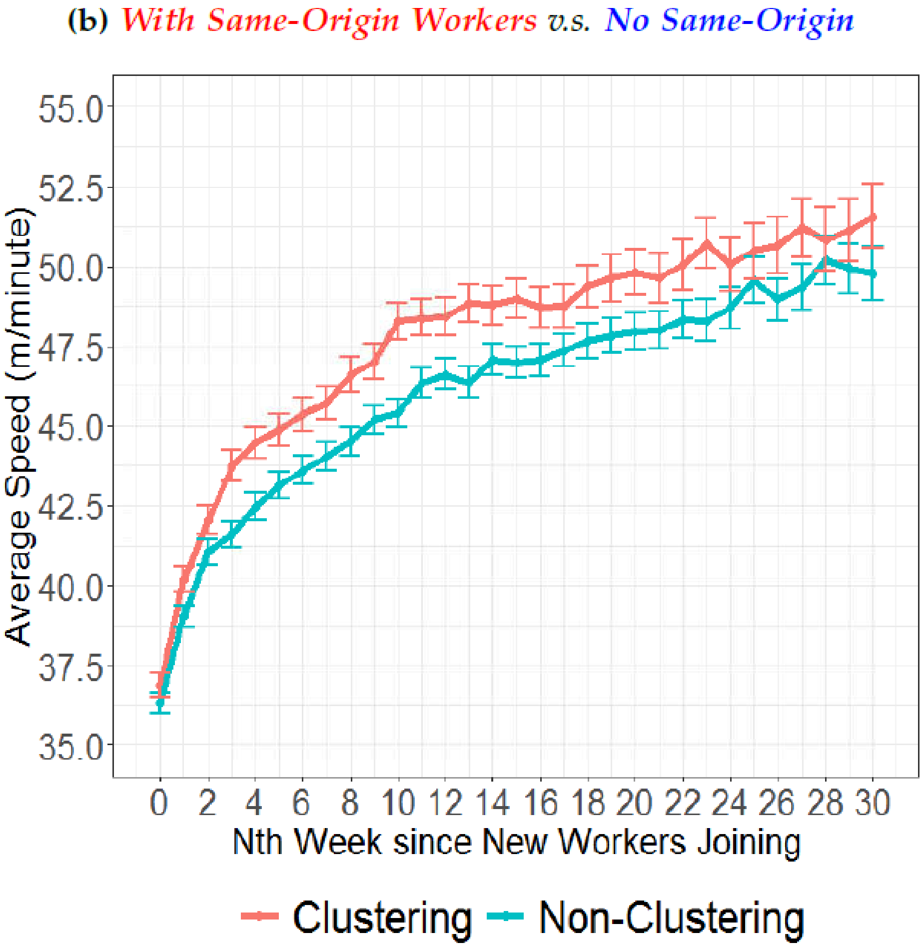



**Table 2:** *Effect of Clustering on Worker Performance*

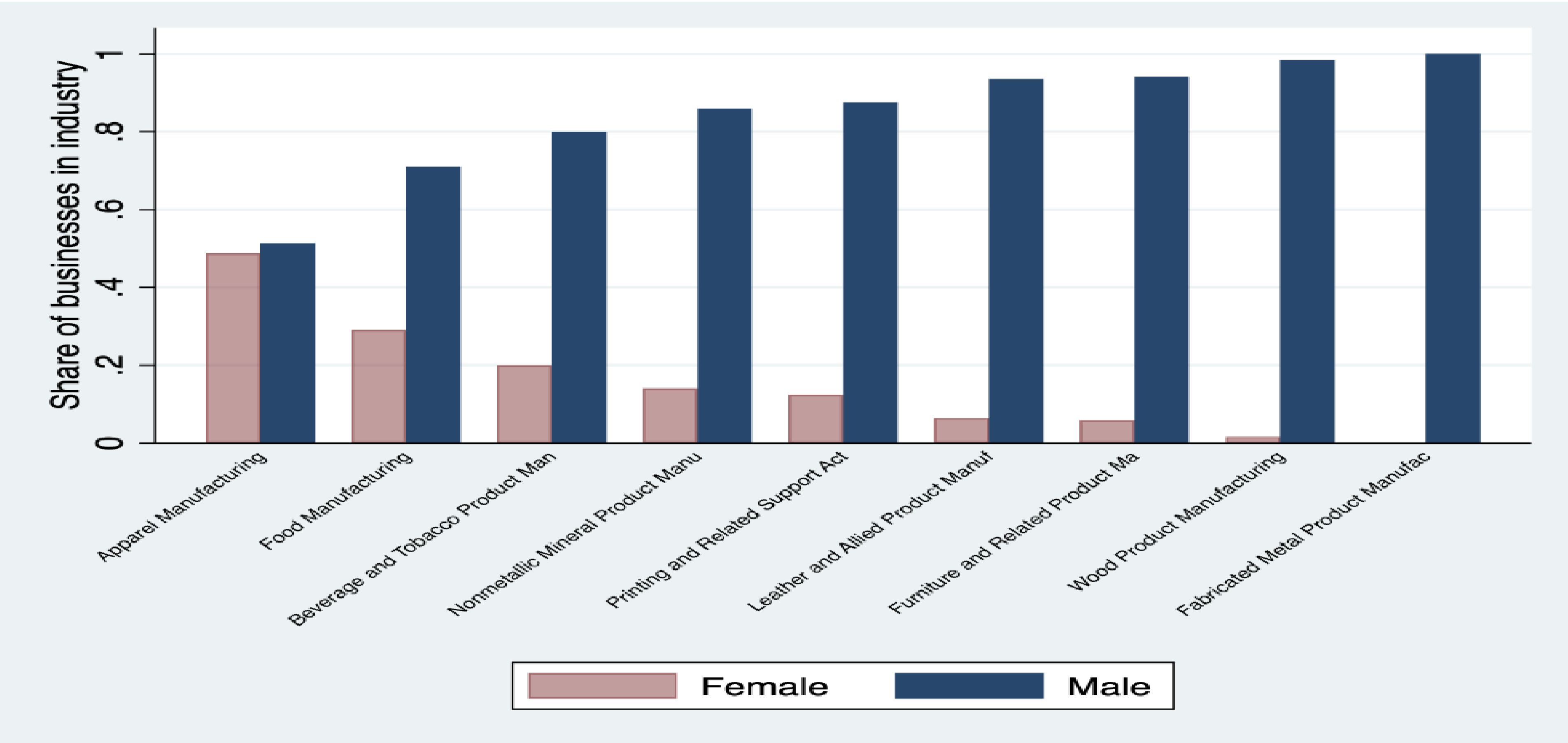
| | (1) Actual Clustering Level | (2) Ave. Speed | (3) Deliveries Per Hour | (4) Total Income | (5) Working Hours |
|---|---|---|---|---|---|
| **Panel A: OLS Regressions** | | | | | |
| Actual Clustering Level | | 18.592*** | 2.203*** | 410.47*** | −10.929 |
| | | (0.681) | (0.214) | (50.305) | (17.495) |
| **Panel B: IV Regressions** | | | | | |
| Predicted Clustering Level | 0.341*** | | | | |
| | (0.011) | | | | |
| Actual Clustering Level | | 17.330*** | 1.957*** | 389.124*** | −32.752 |
| | | (1.075) | (0.351) | (82.448) | (25.648) |
| District X Week FE | Y | Y | Y | Y | Y |
| Hometown FE | Y | Y | Y | Y | Y |
| Entry Cohort FE | Y | Y | Y | Y | Y |
| Ave. Dep. Var. | 2.18 | 46.18 | 4.58 | 682.56 | 24.18 |
| Observations | 417,684 | 417,684 | 417,684 | 417,684 | 417,684 |
| $R^2$ | 0.301 | 0.415 | 0.387 | 0.320 | 0.287 |

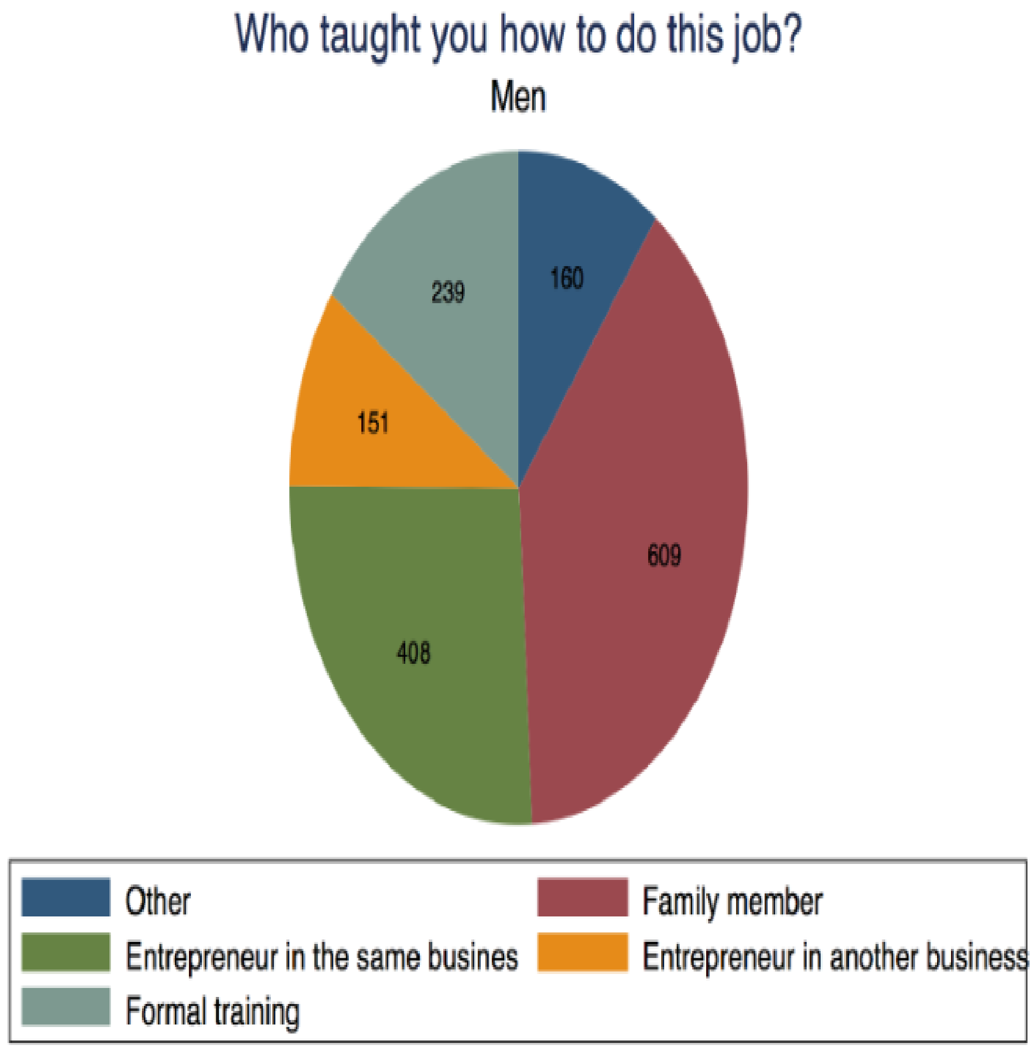
# Tang: a Road-Level Panel, you learn from your referrer's experience almost as much as your own

**Table 3:** *Decompose Local Knowldge*

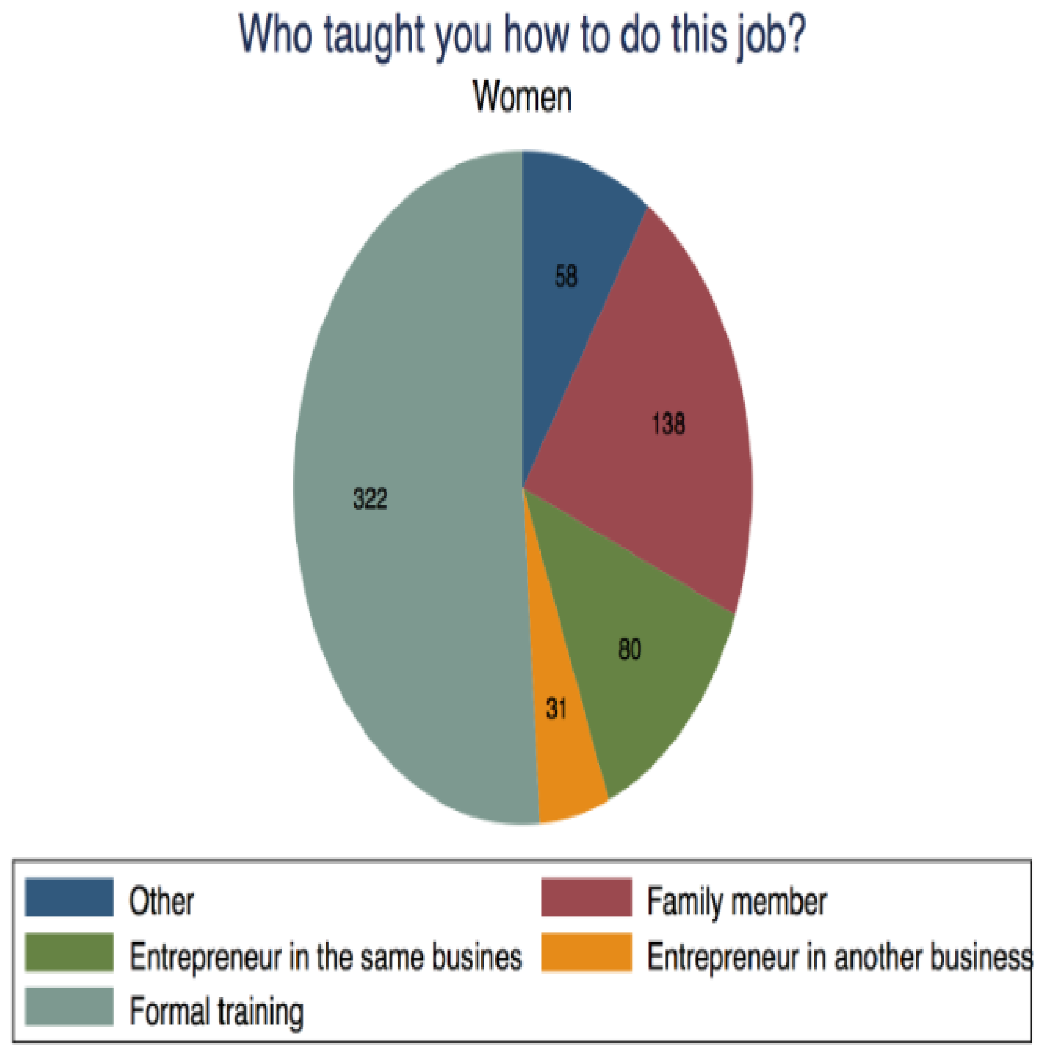
| | Restaurant Searching Time (1) | Road Driving Speed (2) | Consumer Searching Time (3) |
|---|---|---|---|
| $1\{N_{i,a} \geq 2\}$ | -1.447*** | 1.181* | -1.288*** |
| | (0.068) | (0.658) | (0.049) |
| $1\{M_{ij,a} \geq 1\}$ | -0.649*** | 0.611 | -0.708*** |
| | (0.093) | (1.032) | (0.074) |
| Date X Hour X Worker FE | Y | Y | Y |
| Location Grid FE | Y | Y | Y |
| Ave. Dep. Var. | 6.22 | 92.10 | 5.93 |
| Observations | 5,837,304 | 5,837,304 | 5,837,304 |
| $R^2$ | 0.425 | 0.387 | 0.431 |

# Women in apparel and food manufacturing (Nava's Lusaka Census of Businesses)



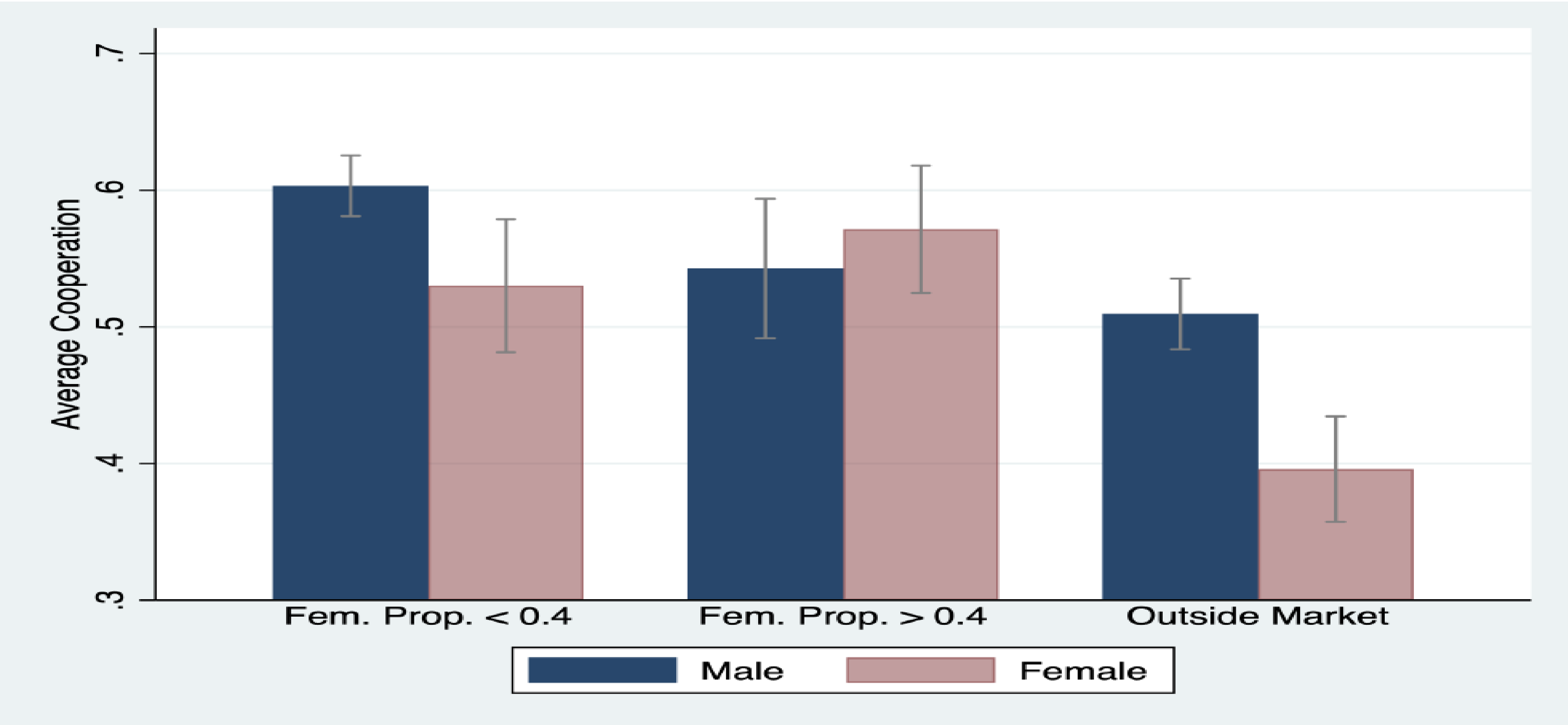



Source: 2016 Lusaka Census of Urban Entrepreneurs. N=1567

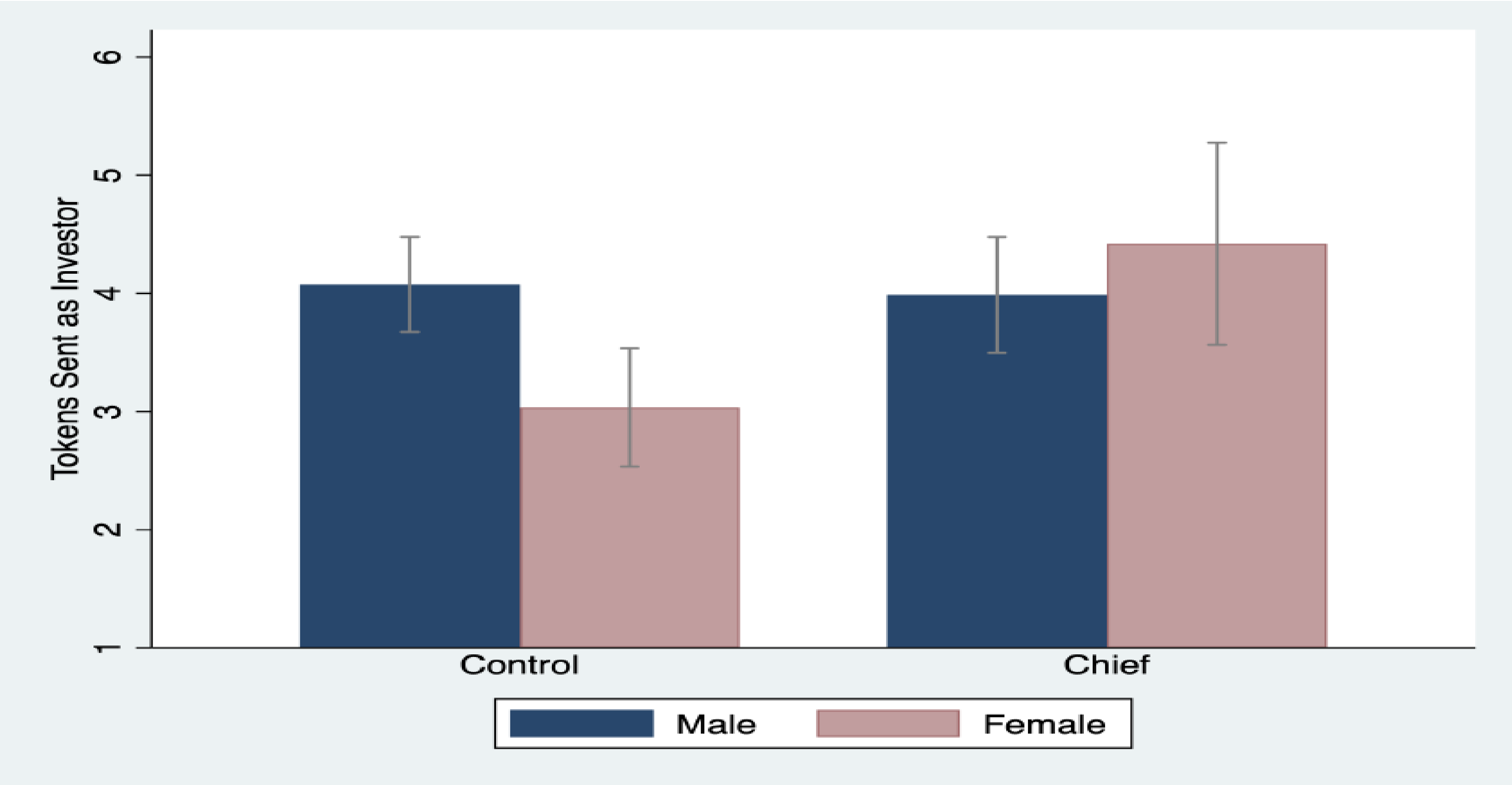



Source: 2016 Lusaka Census of Urban Entrepreneurs. N=629

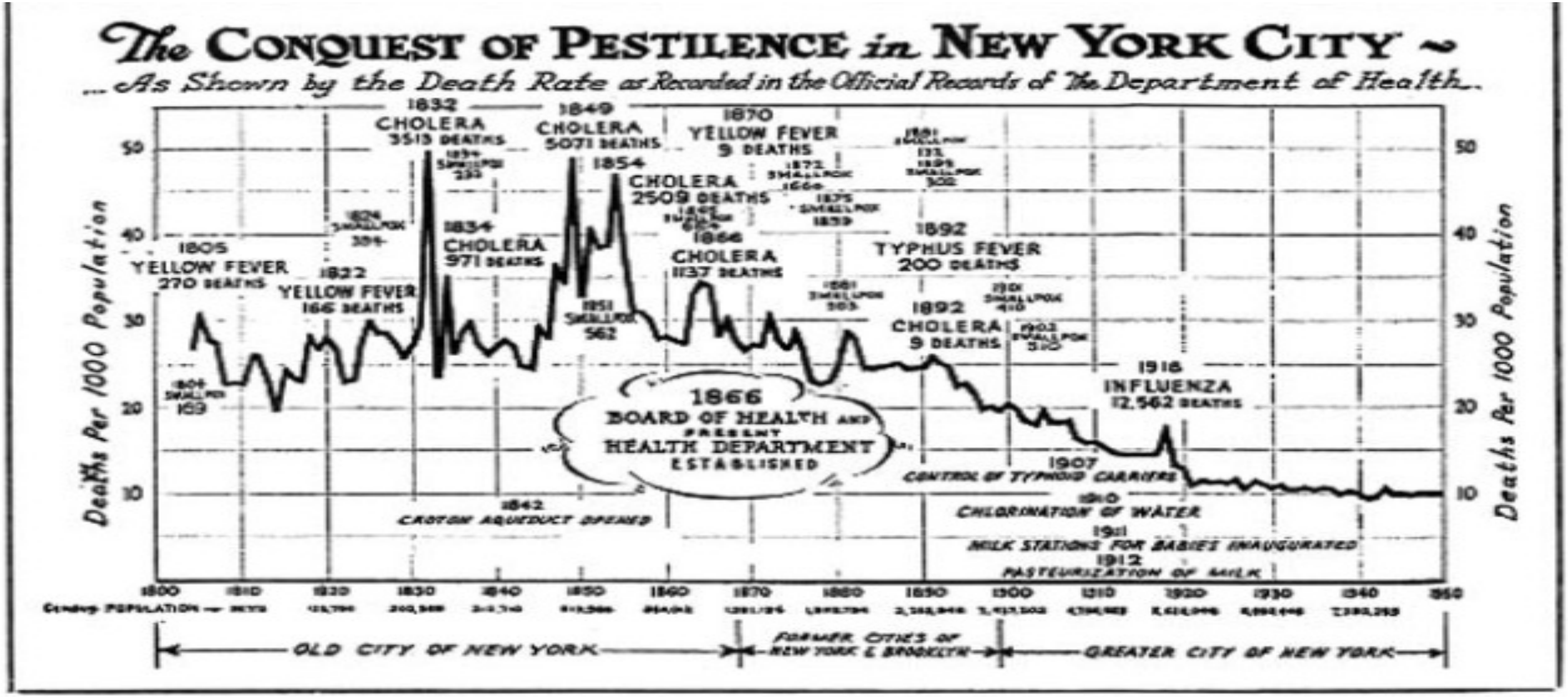
# Women Trust Less; But Markets Ameliorate



# We ran a trust game, with access to a Chief who was debiased by blindness (Goldin and Rouse)



A man transports children through the bustle—and fetid streets—of Mumbai's Dharavi slum. Conditions like this are similar to those that faced many residents of Paris, London, New York, and other large cities in the nineteenth century. *Prashanth Vishwanathan / Bloomberg / Getty Images*

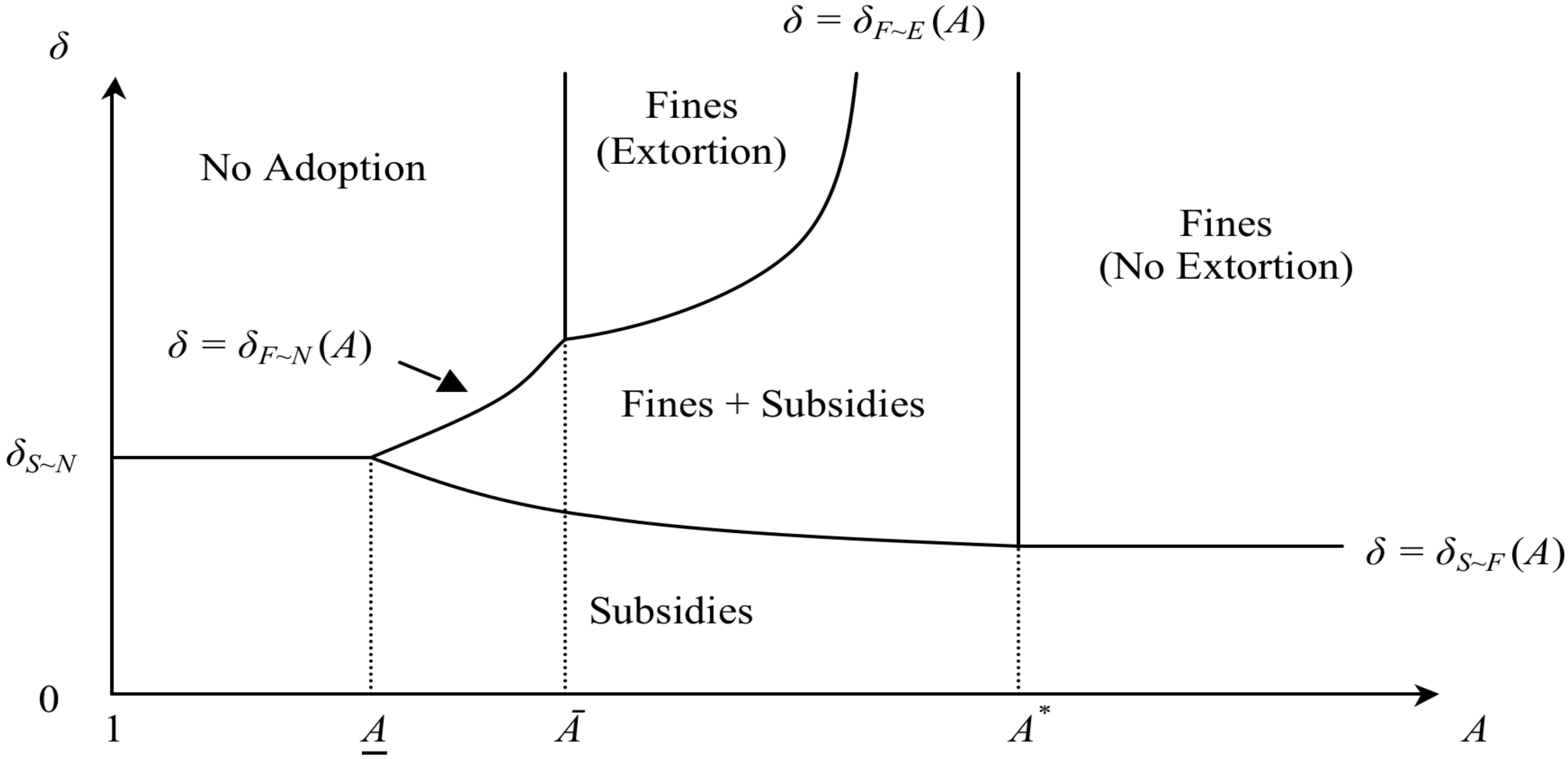


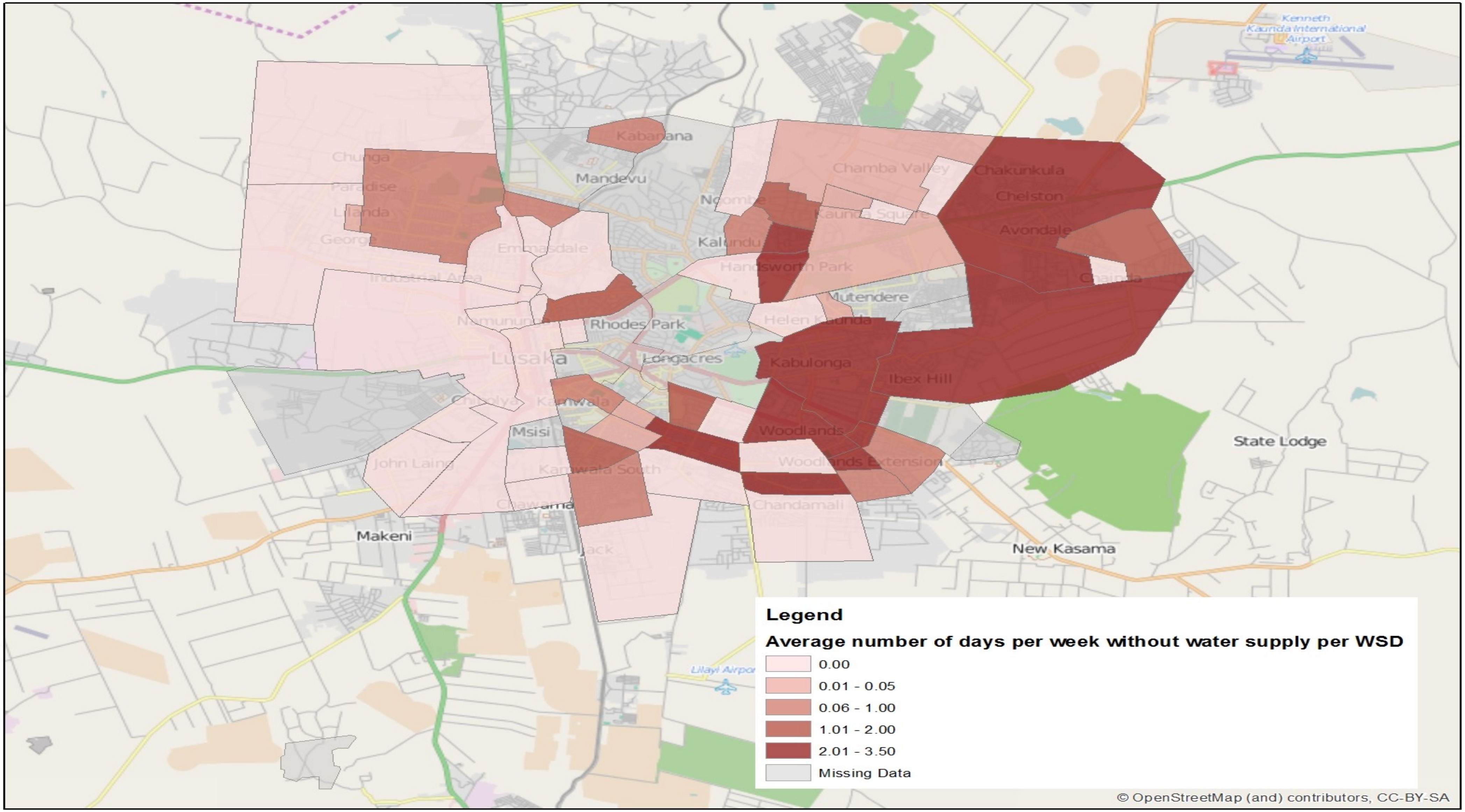

New York City's Department of Health shows the timeline of the city's mortality rate, which sharply dropped with the provision of clean water in the nineteenth century.

*New York City Department of Health and Mental Hygiene*

# Infrastructure: Adoption and Financing

- Basic problem: non-adoption generates negative externalities from contagious disease.
- Willingness-to-pay < Cost of Connection < Value of Connection
- Subsidies plus private providers generates a large opening for subversion by private providers.
  - Strong case for local property tax funding to avoid generating excess urbanization.
- Pigouvian penalties provide an alternative, but one subject to abuse.
- This problem is even more severe with sewerage than with water but the gap between social value and private value is larger.
- The problem is less severe with transportation infrastructure.


$\delta = \delta_{F\sim E}(A)$
$\delta$
Fines
(Extortion)
No Adoption
Fines
(No Extortion)
$\delta = \delta_{F\sim N}(A)$
Fines + Subsidies
$\delta_{S\sim N}$
$\delta = \delta_{S\sim F}(A)$
Subsidies
0
1
$\underline{A}$
$\bar{A}$
$A^*$
$A$


Legend
Average number of days per week without water supply per WSD
0.00
0.01 - 0.05
0.06 - 1.00
1.01 - 2.00
2.01 - 3.50
Missing Data
© OpenStreetMap (and) contributors, CC-BY-SA
Kenneth Kaunda International Airport
Chunga
Paradise
Lilanda
George
Industrial Area
Emmasdale
Kabanana
Mandevu
Ngombe
Kalundu
Chamba Valley
Chakunkula
Chelston
Avondale
Kaunda Square
Handsworth Park
Mutendere
Helen Kaunda
Rhodes Park
Longacres
Lusaka
Kabulonga
Ibex Hill
Chainda
Chibolya
Kamwala
Msisi
Woodlands
Woodlands Extension
John Laing
Kamwala South
Chawama
Chandamali
Makeni
Jack
New Kasama
State Lodge
Lilayi Airport

Panel A: Respiratory Infections

| *Dependent Variable:* | Number of Cases | | | |
|---|---|---|---|---|
| *Age:* | All | Under 1 | 1-5 | Over 5 |
| Days of Supply Issues | 2.40 | .61 | .89 | .90 |
| | (.91)*** | (.29)** | (.32)*** | (.47)* |
| Observations | 1,230 | 1,230 | 1,230 | 1,230 |
| Mean of DV | 461.9 | 97.8 | 147.7 | 216.4 |
| 1 Std. Deviation Increase Effect | 56.9 | 14.5 | 21.1 | 21.3 |
| Observations | 1,230 | 1,230 | 1,230 | 1,230 |

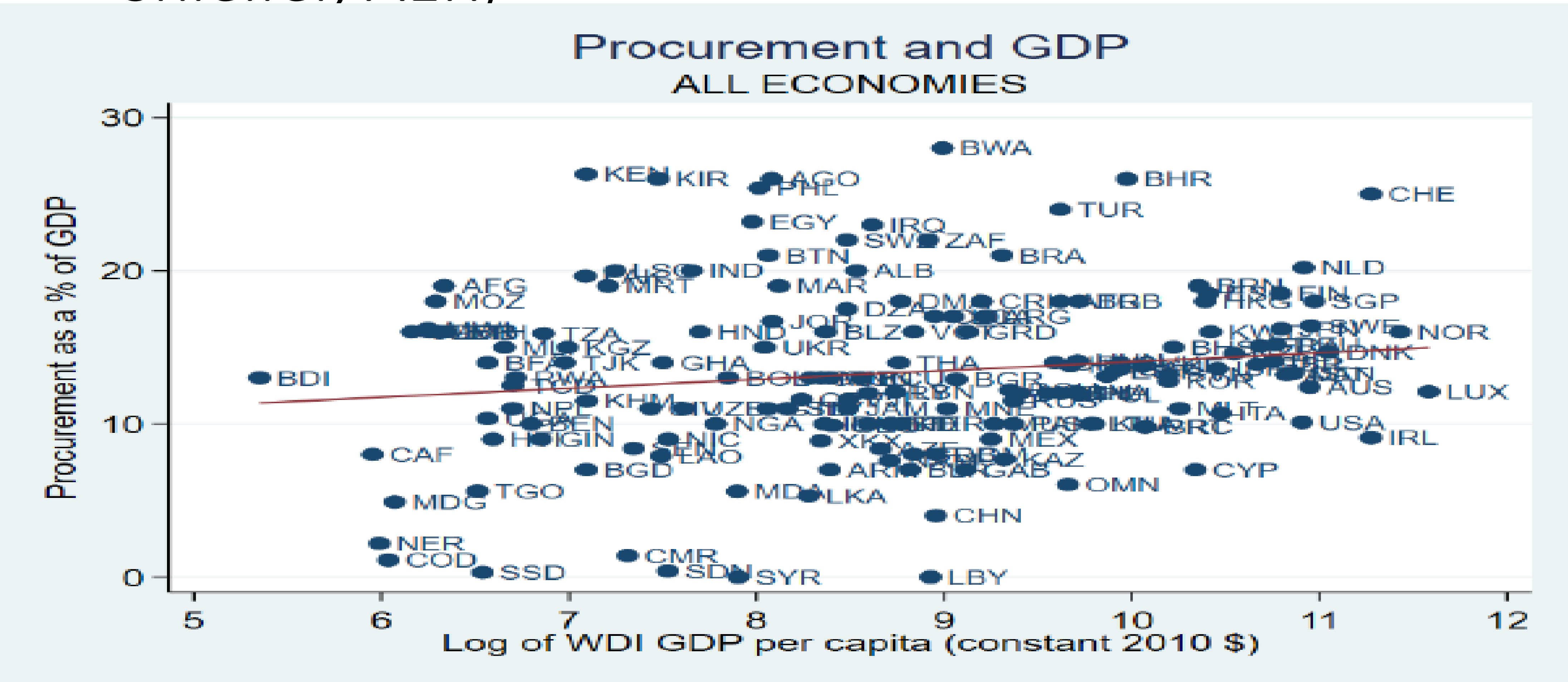
Panel B: Measles

| *Dependent Variable:* | Number of Cases | | | |
|---|---|---|---|---|
| *Age:* | All | Under 1 | 1-5 | Over 5 |
| Days of Supply Issues | .035 | -.00003 | .0047 | .030 |
| | (.010)*** | (.0035) | (.0084) | (.0077)*** |
| Mean of DV | 4.65 | .590 | 2.02 | 2.04 |
| 1 Std. Deviation Increase Effect | .83 | -.0071 | .11 | .71 |
| Observations | 1,230 | 1,230 | 1,230 | 1,230 |

# Metering and Water Supply Problems

| | (1) Average Consumption | (2) % Metered Connections | (3) Peri-Urban | (4) Population Density |
|---|---|---|---|---|
| Days of supply issues | -.192 | -.416** | .484*** | .165 |
| Days of supply issues (normalized by total connections) | -.060 | -.365** | .092 | -.146 |
| Days of Supply Issues (normalized by account complaints) | -.046 | -.505*** | .265* | -.041 |
| Fraction days with at least one supply complaint | -.349** | -.397*** | .299* | -.096 |
| Mean | 197.3 | .548 | .275 | 7,015 |

# Public Procurement (Bosio, Djankov, Glaeser, Shleifer, AER)



# The Regulation of Government

- When regulating private actors, there is usually a tradeoff between limiting negative externalities (which is good) and reducing individual autonomy (which is bad).
- These are not the tradeoffs in the regulation of government.
- The tradeoff is between limiting socially harmful, but privately advantageous actions (e.g. corruption) and allowing the leeway to follow more subtle strategies that benefit society (i.e. choose a better highway builder, even if costs are slightly higher).
- The optimal regulation of government will depend on how aligned the public actor's interests are with society as a whole.

# Four (more or less true) Empirical Implications of the Model

- # 1:  Regulatory Laws that reduce PE discretion reduce bribery.
- # 2: Practices are better than laws when accountability is high and worse when accountability is low.
- # 3:  Process and product improve – regardless of the laws – in more accountable countries.
- # 4:  Regulation is good in low accountability countries and bad in high accountability countries.
- Two measures of accountability: WGI Government Effectiveness and National Human Capital (many past papers on this).

# A Tale of Two Technologies

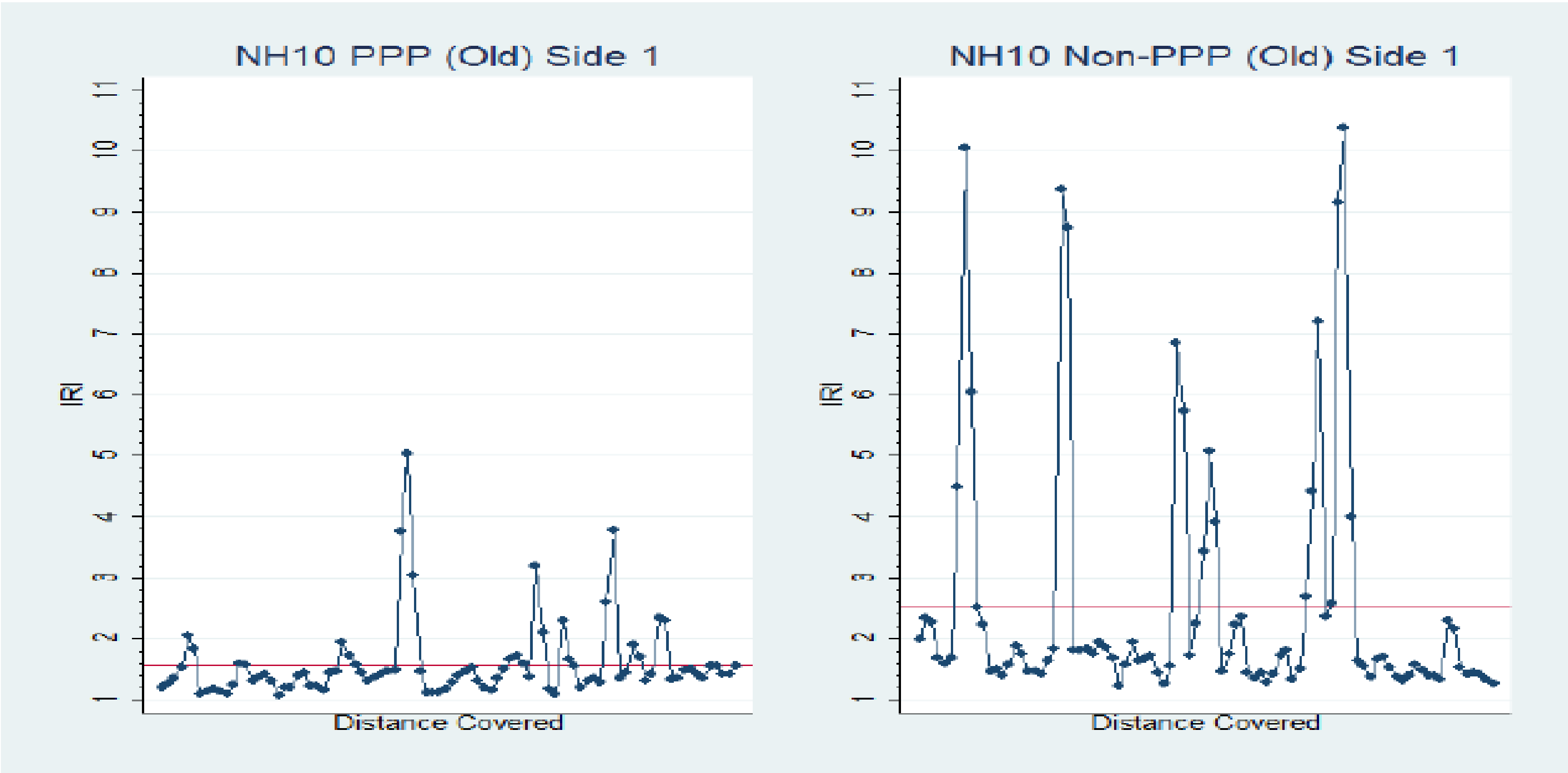

Gautrain by Habib M’henni

# Incentives and Institutions: Singapore

# Congestion and Travel Speeds in the Developing World

- For most of the past 50 years, economists have focused on the externality from congestion.
- The externality both leads to public transportation (bus good, train bad) and to congestion pricing.
- But recently first Kreindler (EM, forthcoming) in Bangalore and Gilles Duranton and his co-authors (using Google maps data globally) have established the non-congested speeds are still quite low in the developing world.
- This makes the case for focusing on road roughness.

# Road Roughness and PPPs in India (Ram Singh)




These plots show that the compared to PPP, the non-PPP neighbour has a significantly higher level of average roughness as well as much larger variance.

# Infrastructure Inequality

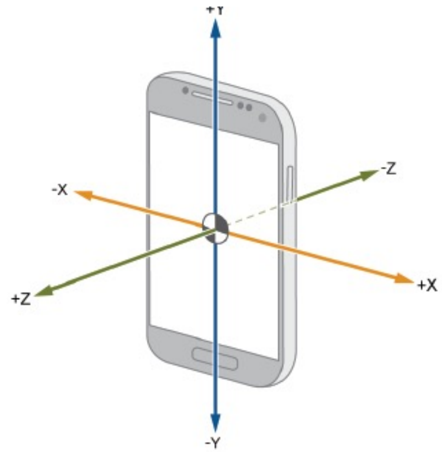
Lindsey Currier, Edward Glaeser and Gabriel Kreindler
Harvard University

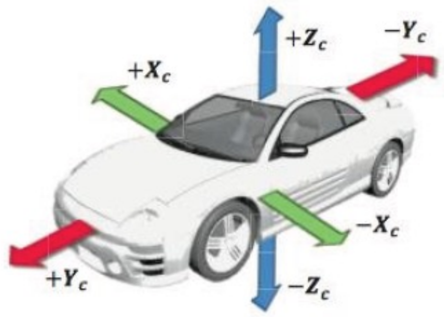
# Data: Raw Uber Smartphone Vertical Acc Data

- Accelerometer data from smartphones of active Uber drivers during Uber trips (∼ 5Hz)
  - Uber proprietary algorithm to re-align axes: vertical acceleration – measures **bumpiness of the trip**

- Map-matched to road segments covering roughly a block
  - Based on Open Street Map (OSM) road segments

- Data periods:
  - entire US (August 2021)
  - Chicago (April 2018 and March-August 2021)



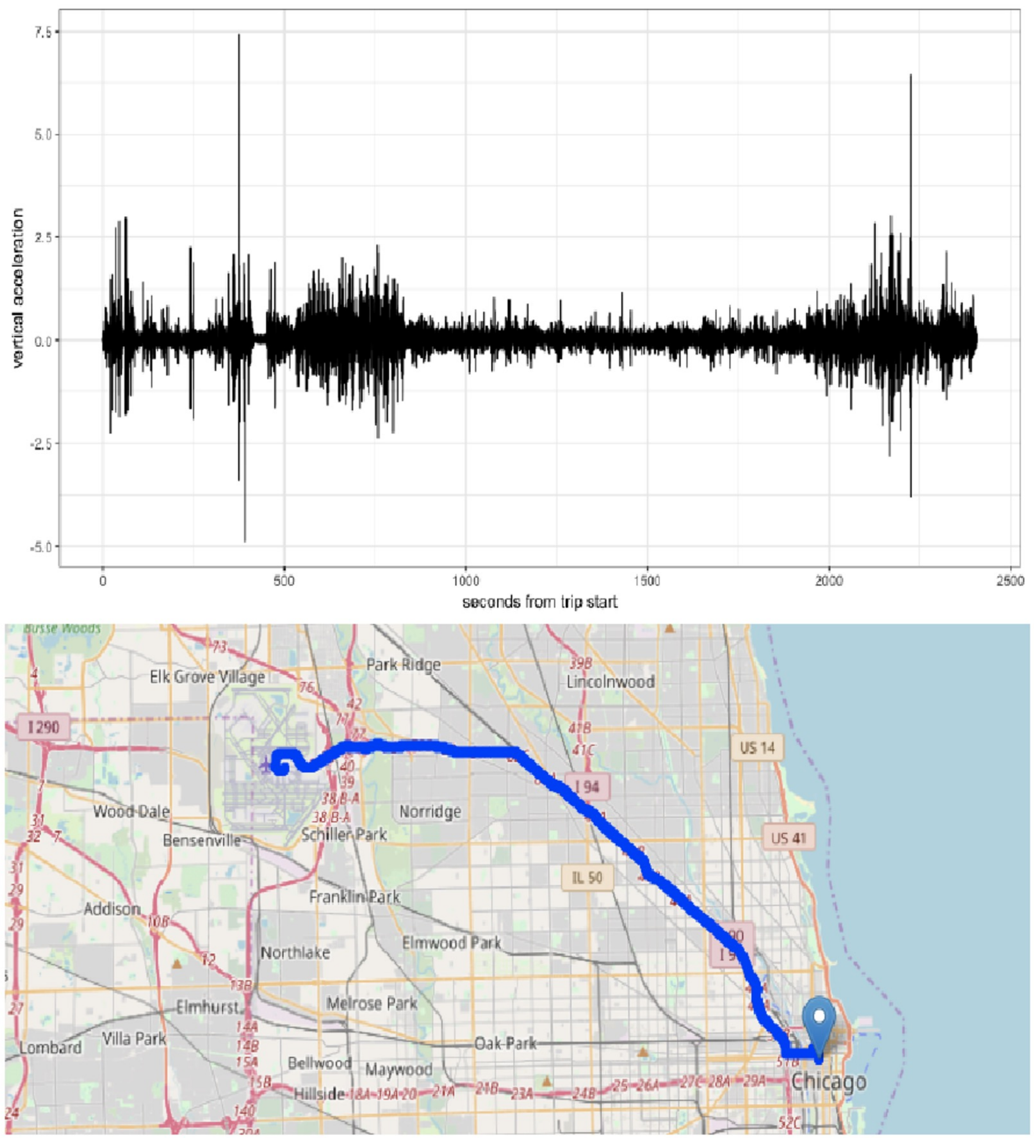



Figure 1: Uber Data Has Signal: Different Types of Roads

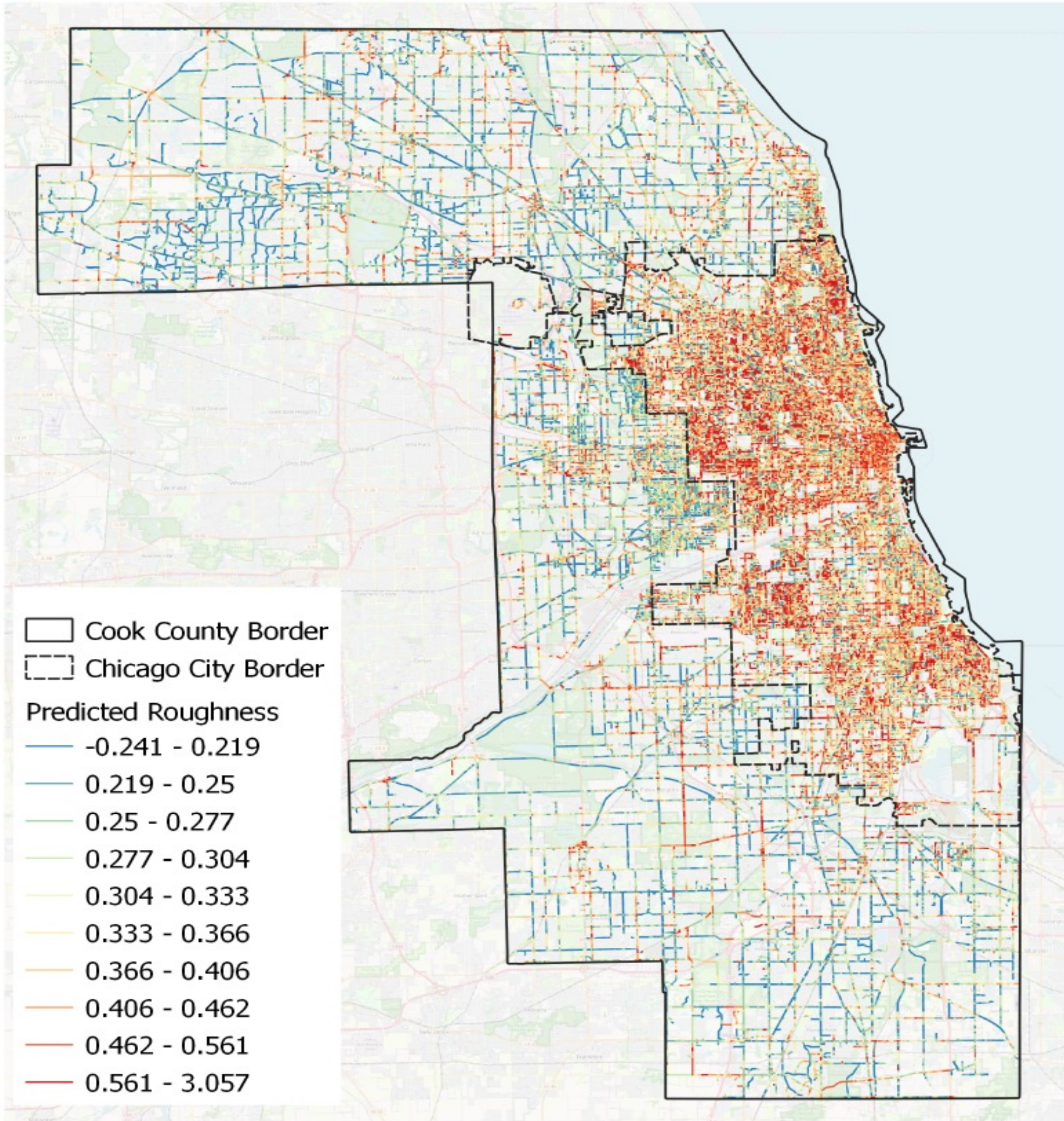
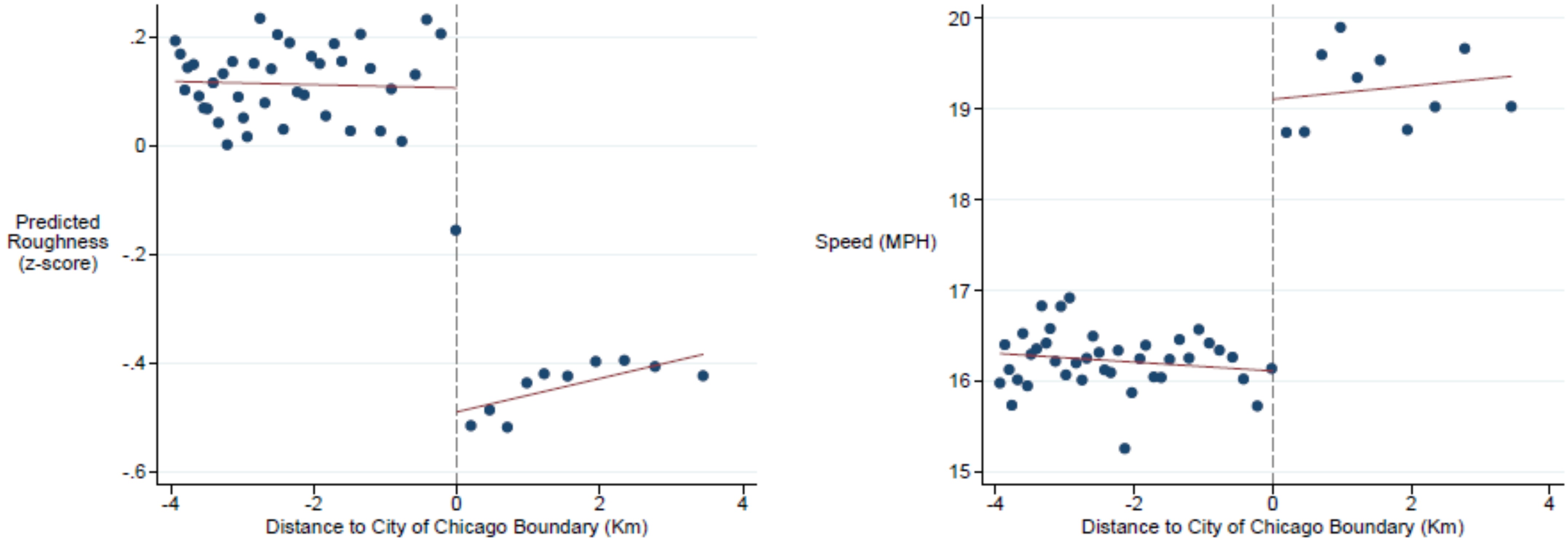



Figure 3: Predicted Roughness at 29 mph in Cook County, IL

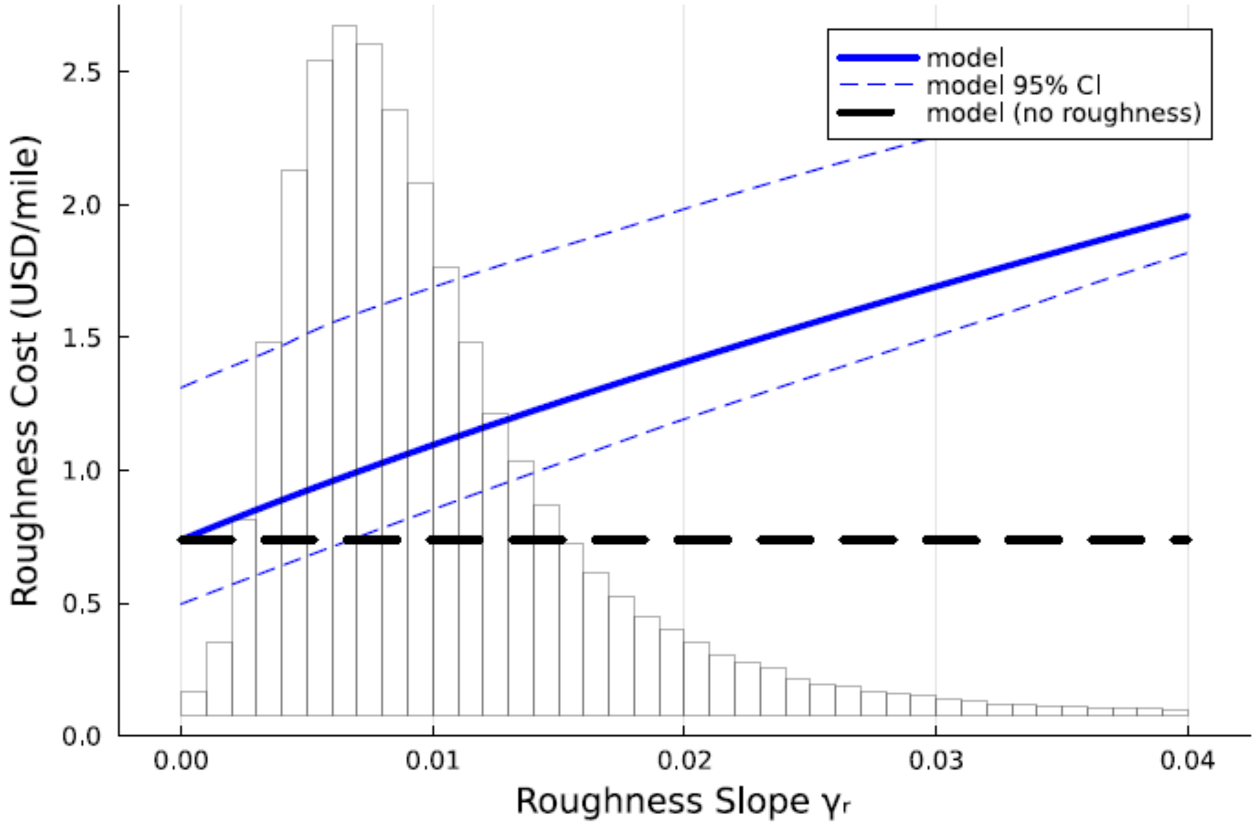
Figure 8: Predicted Roughness and Speed around the Chicago border




Panel (A) Predicted Roughness

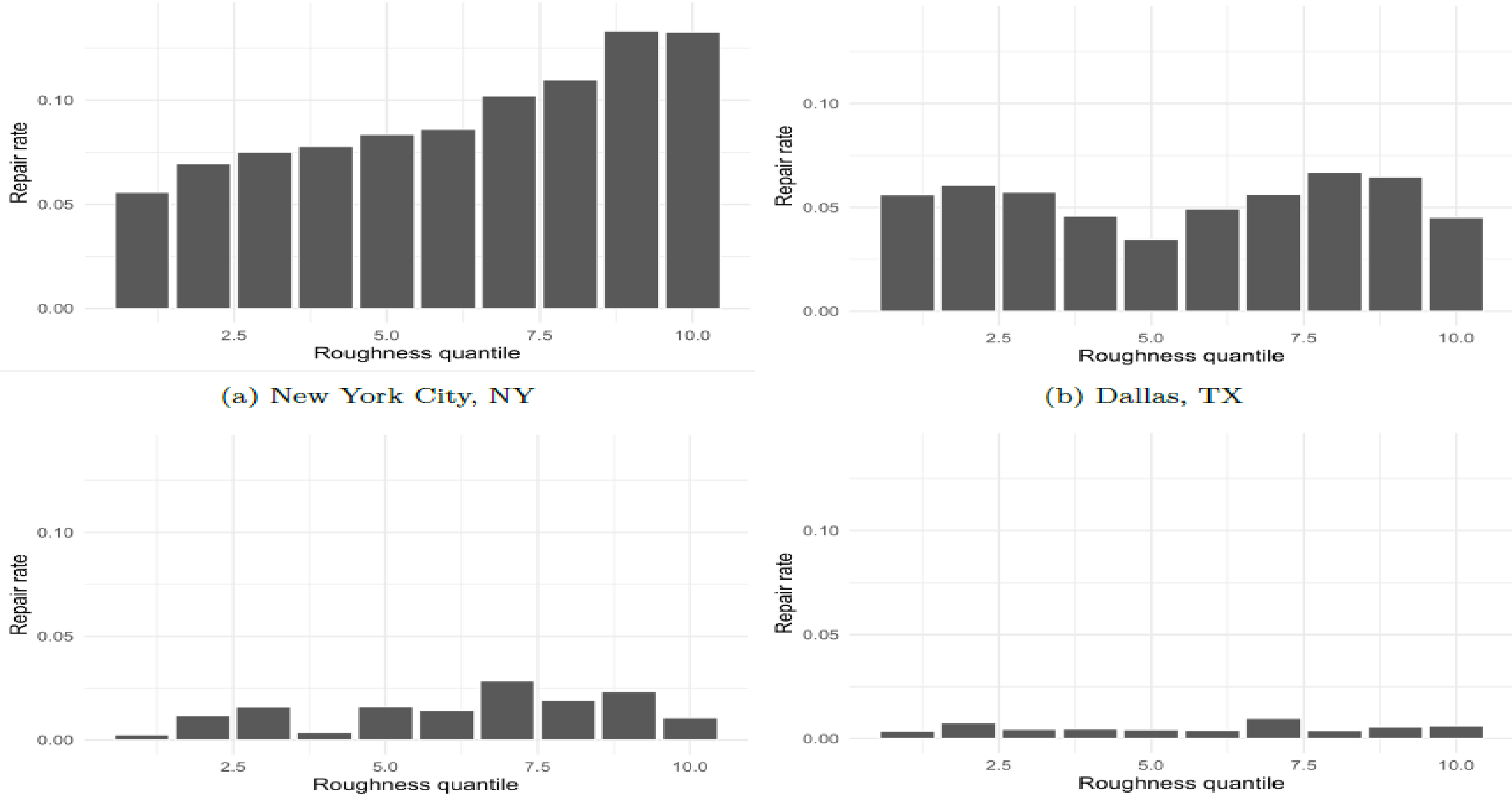
Panel (B) Speed

# Total User Costs of Road Roughness (1 mile segment)




- Median roughness has cost of 0.31 USD / mile
- Cost 1 SD higher road roughness is 0.23 USD / mile CI: [0.2, 0.3]
- Using the road resurfacing data, costs are roughly double

Figure 13: Local Road Roughness and Resurfacing Decisions in Four Cities



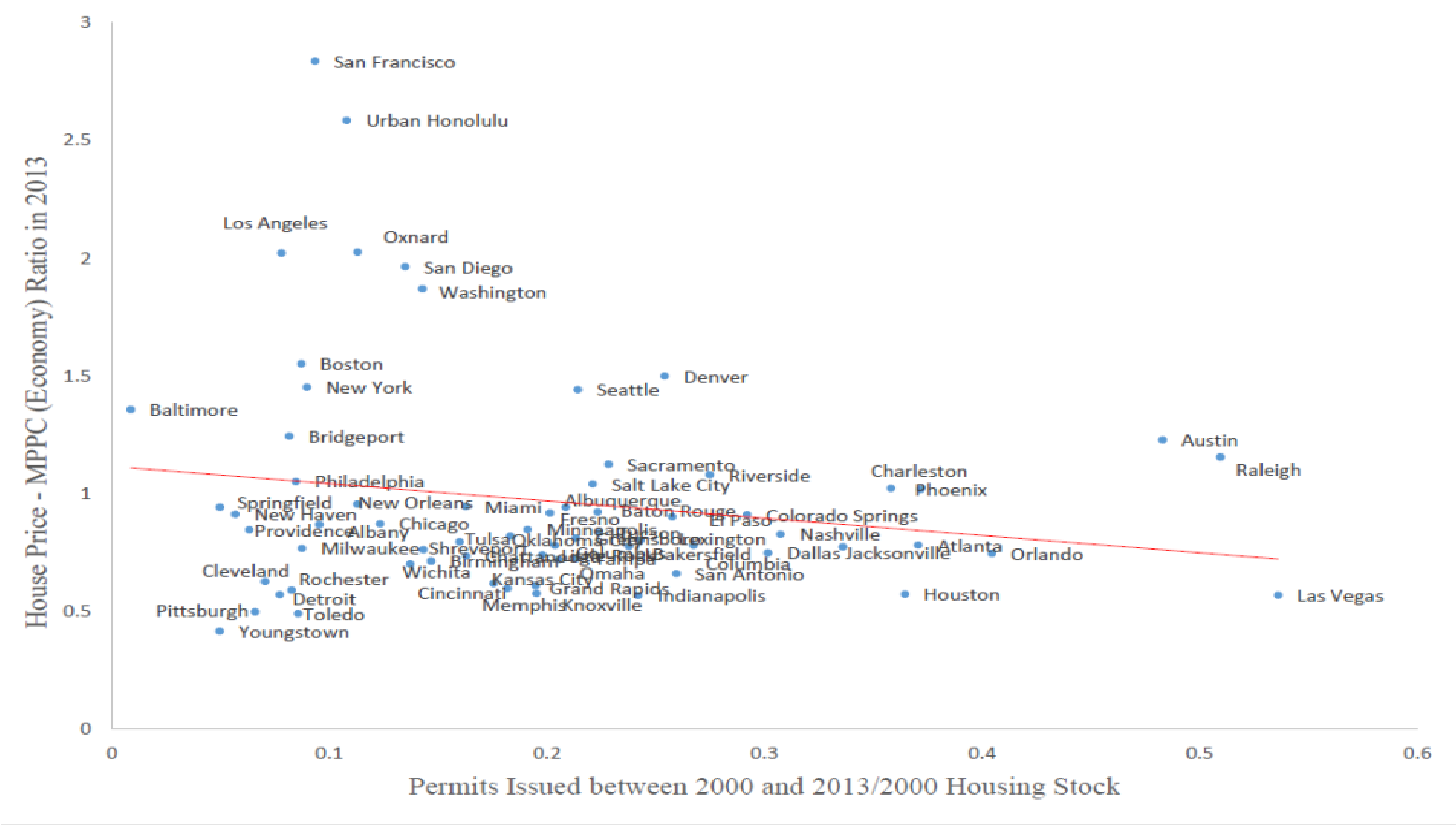

(a) New York City, NY

(b) Dallas, TX

(c) Columbus, OH

(d) Portland, OR

# A Tale of Two Housing Technologies


House Price - MPPC (Economy) Ratio in 2013
Permits Issued between 2000 and 2013/2000 Housing Stock
3
2.5
2
1.5
1
0.5
0
0
0.1
0.2
0.3
0.4
0.5
0.6
San Francisco
Urban Honolulu
Los Angeles
Oxnard
San Diego
Washington
Boston
New York
Baltimore
Bridgeport
Denver
Seattle
Austin
Raleigh
Sacramento
Riverside
Charleston
Phoenix
Salt Lake City
Philadelphia
Springfield
New Haven
New Orleans
Miami
Albuquerque
Baton Rouge
El Paso
Colorado Springs
Fresno
Chicago
Providence
Albany
Minneapolis
Lexington
Nashville
Tulsa
Milwaukee
Shreveport
Bakersfield
Dallas
Jacksonville
Atlanta
Orlando
Birmingham
Columbia
Cleveland
Rochester
Wichita
Kansas City
Omaha
San Antonio
Detroit
Cincinnati
Grand Rapids
Indianapolis
Houston
Las Vegas
Pittsburgh
Toledo
Memphis
Knoxville
Youngstown