Neighborhood Segregation Transport Unemployment

URBS 435
Mid-Term Report
Yuxi Xiong
Research Question

• Understanding the Moderating Effect of Job Accessibility on the Relationship Between Segregation and Unemployment:

• An Application of Structural Equation Modelling in Philadelphia
Content

- Research Significance
  - Theoretical Base
  - City Context
  - Conceptual Models

- Past Research
  - Related Literature
  - Main Takeout
  - Models and Research Design

- Progress and Findings
  - Choosing Variables
  - Descriptive Statistics
  - Policy Implications

- Future Research
  - Further Thoughts
  - Timeline
1.

RESEARCH SIGNIFICANCE

The spatial deprivation for racial minorities in Philadelphia had been a serious problem since the 1850s.
Kain, 1968
Racial segregation affects the distribution of African American’s unemployment, reduces job opportunities for inner city dwellers, and the post war segregation aggravates this problem.

Wilson, 1987
The wrenching shifts in the economy from manufacturing to service industries and the large exodus of manufacturing jobs from Northern cities proved especially deleterious for black men.

Grengs, 2010
The car’s advantages in job accessibility are so extreme, and the prospects for serving the most disadvantaged people with public transit are so limited.

RESEARCH SIGNIFICANCE
SPATIAL MISMATCH

From spatial mismatch and the truly disadvantaged to model mismatch, how the theory evolves through decades...
Background Info

WHY PHILADELPHIA

Philadelphia is ranked one of the most distressed central cities in the U.S due to the severe rate of unemployment and neighborhood abandonment. Estimation shows that 37.9% of Hispanic population and 30.8% of Black population are struggling in poverty in 2017.

Transport System

The SEPTA (Southeastern Pennsylvania Transportation Authority) provides a generally high transit access rate for Philly dwellers. However, the average car ownership (0.51) is significantly lower than national average (0.85).

High Segregation Rate

The Brown S4 research shows that Philadelphia has the second highest segregation rate among 30 biggest US cities. The geographic indicates that the city is distinguished by ‘black counties’ and white zones.
The latest 2022 census indicates the total population of Black residents being 42.13% of the total population.

Total Population

The northwest and southwest regions are mostly Black neighborhoods. There's also a block group lying in the east with high density.

Segregation
The latest 2022 census indicates the total population of Hispanic residents being 14.1% of the total population.

Hispanic neighborhoods are concentrated in northern inner city.
**Best Socio-Economical Status**

Only 12.7% of white population in Philly is living in poverty, nearly 1/2 of the city’s average rate.

**Most Unemployed**

The unemployment rate of Black people in 2020 is 14.6%, which is continuously worsened by the COVID-19.

**Most Poverty**

The ‘North Philly’ with highest concentration of poverty overlaps with the segregated Hispanic residential zone.

**Increased Poverty**

23.1% of Asian in Philly struggles with poverty. The rate is slightly lower than the city average of 23.3%. There’s notable increase during the past decades.
Structural Equation Modelling

CONCEPTUAL MODEL

Neighborhood Segregation
Directly measured by Dissimilarity Index

Unemployment
Directly measured by unemployment rate

Demographics
Percentage of working age population, education rare

Built Environment
Maintenance, safety

Transport Equity
Latent variable
Measured by transit-based job accessibility, percentage of job accessible, and percentage of low wage worker using transit

Others
... ...
2. PAST RESEARCH

Study indicates both the moderating and mediating effect of transport on the relationship between residential segregation and socio-economic outcomes.
Lyons & Ewing

**CAR OWNERSHIP AND TRANSIT ACCESSIBILITY**

Anderson and Galaskiewicz

**RACE, INEQUALITY AND JOB ACCESSIBILITY**

Power

**POVERTY IN RESIDENTIAL AREAS AND TRANSIT EQUITY**

Yeganeh et al.

**SOCIAL EQUITY AND JOB ACCESSIBILITY**
The spatial mismatch theory generally fits the segregation pattern in Philly. However it requires further testing after the accessibility data is generated.

**Effect of Transport**

The small but observable effect is correlated with a variety of control factors. Noticing there could be a difference in the National scale census and case study.

**Segregation and Poverty**

There's proven relationship between these, however their relationship with transit individually need to be tested.

**How to do Case Study**

Look closer to the historical background of the city for analyzing in depth.

**Adjusting Model**

The compactness of model and the importance of choosing suitable explanatory variables.

**Using Theoretical Models**

The spatial mismatch theory generally fits the segregation pattern in Philly. However it requires further testing after the accessibility data is generated.
PAST RESEARCH

SUMMARY OF MODELS AND RESULTS

We concluded past related studies for summarizing the most common approach in segregation, unemployment and transport accessibility related studies.

- Models: The most used models for data analysis are hierarchical linear model and structural equation modelling.

- Data Source: American Community Survey and Brown S4 are shared data source among most studies.

- Results: Most national scale studies concludes positive relationship between segregation and job inaccessibility. The mediating effect of transport on eliminating such relationship is also shown in some studies.
3. CURRENT PROGRESS

Structural Equation Modelling in this research allows the study of mediating variable and complex relationship between factors.
**CHOICE OF VARIABLES**

- **Dissimilarity Index**: Calculated from block group level population data.
- **Transit Equity**: This category includes transit accessibility index, automobile accessibility index and automobile ownership.
- **Neighborhood**: Vacancy rate and annual age of buildings used to measure the neighborhood quality.
- **Socio-Economical**: Educational rate, income level and percentage of low wage workers are included.
- **Unemployment**: Direct measure.
TESTING MODEL RESULTS

Transit Access Index
No statically significant correlation with segregation.

Percentage of Low Wage
More related to Hispanic residential segregation rather than African American segregation.

Percentage of Unemployment
No statically significant correlation with segregation, however there’s strong correlation with transit access index.
Based on the importance of automobile in adjusting the transport equity for segregated neighborhoods, we suggest for the increase in governmental subsidy on supporting household automobile purchase.

$66/Month
$792
Average annual car maintenance fee
4. FUTURE RESEARCH

What we are seeing and expecting beyond our current research...
Future Research

Directions of Further Research

- Rust Belt
  Transit Equity in Rust Belt Cities
  Expanding the geographical scope of study

- East VS West
  Comparison Between Cities
  Automobile oriented California VS Public transport in East Coast

- US&UK
  When SEPTA Meets TFL
  Cross national case studies on public transport and unemployment
May
Writing/Regression Model Fitting
Finishing the final report and managing our codebook

JUL/AUG
Data Analyzing
Paper writing for data analysis part along with model adjustment

JUN
Regression Model Fitting
Finalizing the choice of variables and data cleaning, work out the draft of hierarchical linear regression

SEPT
Paper Writing
Start to merge all writing pieces together and form the draft research paper
With My Sincere Appreciation to:

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THANK YOU! FOR YOUR ATTENTION