Public transit effects on homeownership, credit

NSF Proposal, Fall 2023

Kyra Sadovi

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Outline

Brief Explanation of the NSF Application Process

Research idea: Public transit effects on homeownership, credit

Problems, possible variations

The NSF Application

- Application composed of:
  1. **Research proposal**
  2. Personal statement
  3. Letters of recommendation
- Two evaluation criteria:
  1. Intellectual merit: How important is the proposed activity to advancing knowledge within its own field or across different fields?
  2. Broader impacts: How well does the proposed activity benefit society or advance desired societal outcomes?
- These criteria are weighted **equally**.
- I can assume I have access to any data I could want.

Brief Explanation of the NSF Application Process

Research idea: Public transit effects on homeownership, credit

- Introduction
- Trains
- Buses

Problems, possible variations

Research idea

- I am interested in measuring the effect of increased access to public transit on residents' credit health and the local homeownership rate.
- **Existing** residents only.
- Equifax CCP, WalkScore ©.

Potential for broader impact

- Chetty et al. find that transportation has a significant impact on economic mobility[1].
- It has also been demonstrated to have effects on local employment outcomes, particularly job retention.[2]
- Because of its ability to increase mobility in metro areas, it has the potential to decrease racial and socioeconomic segregation.[3] But individual projects potentially catalyze the onset of gentrification.[4]

[1] Chetty et al., *Where is the Land of Opportunity? The Geography of Intergenerational Mobility in the United States*.

[2] Sanchez, "The Connection Between Public Transit and Employment".

[3] Grengs, "Does Public Transit Counteract the Segregation of Carless Households? Measuring Spatial Patterns of Accessibility".

[4] Padeiro, Louro, and Costa, "Transit-oriented development and gentrification: a systematic review".

Trains vs. Buses

Trains

Advantages of trains:

- Commuters tend to value trains more than buses[5].
- They comprise a larger investment (broader impact).

Disadvantages of trains:

- They comprise a larger investment (harder to find controls).
- Relatively few examples to use.
- Examples that do exist are not all the same (light rail vs commuter rail, areas serviced, etc.).

[5] Brooks and Denoeux, "What if you build it and they don't come? How the ghost of transit past haunts transit present".

Proposed approach to trains

- Treatment case: a neighborhood where a new train station is built.
- Control: a neighborhood where a new train station is proposed but either delayed or cancelled.

Create a synthetic treatment group[6]:

- Create a dataset of examples of failed or postponed transit projects.
- Weight characteristics of control units to match treated, e.g.:
  - Pre-treatment average income of area served.
  - Pre-treatment homeownership rate of area served.

[6] Gunsilius, *Distributional synthetic controls*.

Buses

Advantages of buses:

- Significantly more examples of new bus lines.
- Much less anticipatory investment needed, so I posit that property values would be less likely to change significantly.
- Because less anticipatory investment, could simply compare area affected to immediately adjacent unaffected area – no need to find cancelled lines.
- Bus rapid transit (BRT) is en vogue in many cities now[7].

Disadvantages of buses:

- Commuters prefer trains, so treatment effect could potentially be smaller.

[7] Padeiro, Louro, and da Costa, "Transit-oriented development and gentrification: a systematic review".

Proposed approach to buses

- Treatment case: a neighborhood where a new bus line is introduced.
- Control: areas adjacent to affected areas.

Gupta et al. use a similar structure for measuring the impact of the Q train on nearby property values. They find a significant difference between the effect of the train on the directly affected 2nd Ave. corridor and control areas two blocks east, two blocks west, and four blocks west.[8] I could use the same setup for buses.

[8] Gupta, Van Nieuwerburgh, and Kontokosta, *Take the Q Train: Value Capture of Public Infrastructure Projects*.

Brief Explanation of the NSF Application Process

Research idea: Public transit effects on homeownership, credit

Problems, possible variations

- Property value endogeneity
- Dependent variables

Property value endogeneity

- While I could control for property value increase after announcement of project, I would have a harder time isolating effects of the project on credit and homeownership from property value increases that are due to the physical opening of the station.
- Primarily a problem with train example.

Dependent variables: What would be the most interesting measure?

- Existing homeowners:
  - Rates of successful refis
  - Rates of mortgage delinquency
- Existing renters:
  - Rates of homeownership (incl. if they move away)
- All existing residents:
  - Rates of delinquency on various types of credit lines (credit cards, auto loans, etc)

References I

Brooks, Leah and Genevieve Denoeux. "What if you build it and they don't come? How the ghost of transit past haunts transit present". In: *Regional Science and Urban Economics* 94 (2022). Urban Economics and History, p. 103671. ISSN: 0166-0462. DOI: https://doi.org/10.1016/j.regsciurbeco.2021.103671. URL: https://www.sciencedirect.com/science/article/pii/S0166046221000314.

Chetty, Raj et al. *Where is the Land of Opportunity? The Geography of Intergenerational Mobility in the United States*. Working Paper 19843. National Bureau of Economic Research, Jan. 2014. DOI: 10.3386/w19843. URL: http://www.nber.org/papers/w19843.

Grengs, Joe. "Does Public Transit Counteract the Segregation of Carless Households? Measuring Spatial Patterns of Accessibility". In: *Transportation Research Record* 1753.1 (2001), pp. 3–10. DOI: 10.3141/1753-01. eprint: https://doi.org/10.3141/1753-01. URL: https://doi.org/10.3141/1753-01.

Gunsilius, Florian. *Distributional synthetic controls*. 2021. arXiv: 2001.06118 [econ.EM].

References II

- Gupta, Arpit, Stijn Van Nieuwerburgh, and Constantine Kontokosta. *Take the Q Train: Value Capture of Public Infrastructure Projects*. Working Paper 26789. National Bureau of Economic Research, Feb. 2020. DOI: 10.3386/w26789. URL: http://www.nber.org/papers/w26789.
- Padeiro, Miguel, Ana Louro, and Nuno Marques da Costa. "Transit-oriented development and gentrification: a systematic review". In: *Transport Reviews* 39.6 (2019), pp. 733–754. DOI: 10.1080/01441647.2019.1649316. eprint: https://doi.org/10.1080/01441647.2019.1649316. URL: https://doi.org/10.1080/01441647.2019.1649316.
- Padeiro, Miguel, Ana Louro, and Nuno Marques da Costa. "Transit-oriented development and gentrification: a systematic review". In: *Transport Reviews* 39.6 (2019), pp. 733–754. ISSN: 0144-1647. DOI: https://doi.org/10.1080/01441647.2019.1649316. URL: https://www.sciencedirect.com/science/article/pii/S014416472200157X.

References III

Sanchez, Thomas W. "The Connection Between Public Transit and Employment". In: *Journal of the American Planning Association* 65.3 (1999), pp. 284–296. DOI: 10.1080/01944369908976058. eprint: https://doi.org/10.1080/01944369908976058. URL: https://doi.org/10.1080/01944369908976058.