Helping the Middle-Class: How Interest Rates Affect the Distribution of Housing Wealth

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Interest Rates and the Distribution of Housing Wealth

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- Yet little is known about the effect of interest rates on the distribution of housing wealth. This effect is critical because the value of a home represents most of a household's total wealth, and households have high MPC out of housing wealth (Mian and Sufi 2009).

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Question and Main Contribution

Today:

- Do all homeowners experience equal changes in housing wealth after changes in interest rates?

What will you learn with this paper?

- Interest rate changes causally affect the distribution of house prices within a metro area.
- Channel: Changes in interest rates affect housing demand through the mortgage payment channel.

What will you NOT learn with this paper?

- Effects of interest of rates on house prices through other channels other than the mortgage payment channel.

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Main Contribution and Main Result

- Novel identification strategy that estimates latent demand for small neighborhoods (7k people) based on incidental differences in the distribution of metropolitan population (2M people).

- Using the interest rate changes between Jul-00 and Dec-01, I show that for a 1.2% decline in mortgage interest rates:
  - Homeowners in Low- and high-priced neighborhoods experience no gains in house prices;
  - In contrast, homeowners in middle-priced neighborhoods experience gains of 7% to 8.5% in house prices ($11,000 to $12,000).

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Empirical Design

Mechanism: Mortgage Payment Channel

- Households are budget constrained and choose to allocate $\overline{m}$ of their disposable income on housing consumption. Given their cost of capital, they choose housing tenure, and if they decide for homeownership they maximize the home value that they can purchase:

$$HV(r) = \frac{\overline{m}}{r} \times \left(1 - \frac{1}{(1+r)^{\tau}}\right) + D.$$

$$r \downarrow \text{ causes } HV(r)$$

- Important: Three agents: Homeowners and Renters who might become home buyers; Existing homeowners who don't move and might experience housing wealth changes.

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Mechanism for Distributional Effects

- To make sense of the empirical findings, I need a theoretical framework that allows different houses to be priced by different buyers which determine different prices.
- In other words, the prices of luxury homes are determined by the Euler equations of people like Bill Gates, while the prices of middle-priced houses are priced by middle-incomers, and the prices of shabby houses are determined by the Euler equations of poor households.
- When interest rates drop, neither Bill Gates nor poor people are affected. Poor households are credit constrained, and the most wealthy households are not liquidity constrained so not sensitive to interest rate changes. However, middle-income households who finance their houses with mortgages experience a large change in what houses they can now afford.
- The assignment model of housing in Landvoigt, Piazzesi and Schneider (2015, AER) is a framework that explicitly allows for differential capital gains across housing segments. The model has a distribution of house qualities. The quality of a house is reflected by its price similarly to the neighborhoods in this paper.

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Empirical Design

Lender's Rule of Thumb and Affordability Assumption

- *"Lenders typically insist that no more than 28 percent of a borrower's gross income be used for monthly housing expenses and that no more than 36 percent of that income be used for payment of all recurring debt."* in New York Times, July 25th, 1999.

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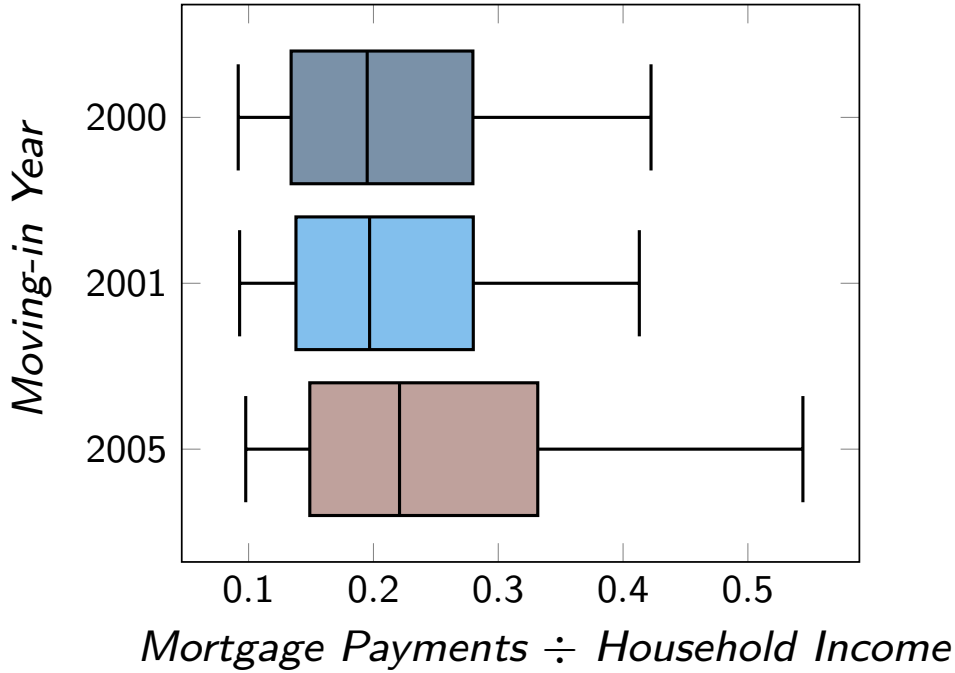

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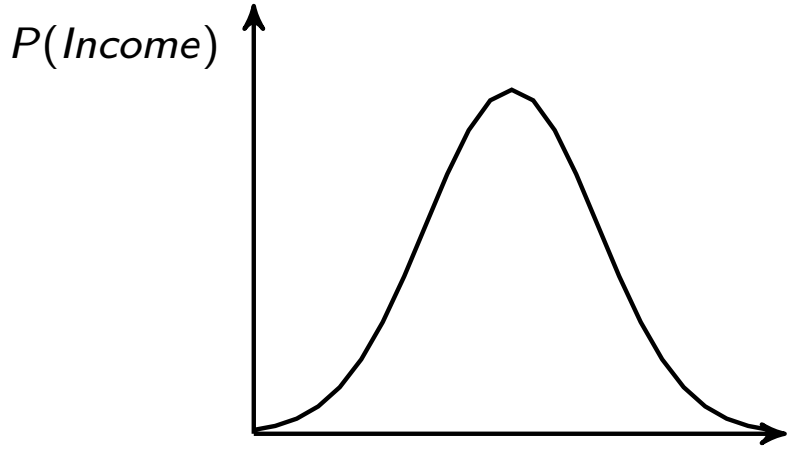
Empirical Design

- Consider the metropolitan area of Cleveland, OH.

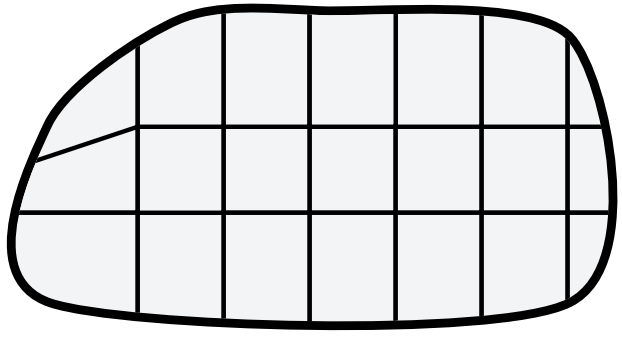
Empirical Design: Mortgaged-out

Consider the income distribution of a metropolitan area in 2000, and that the interest rates level in Jul-2000 is $r_{Jul/2000}$.

Cleveland, OH



Map of Neighborhoods:



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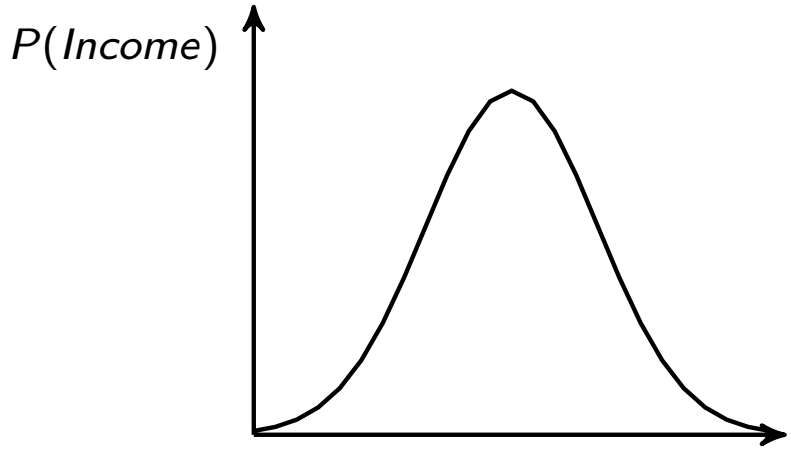

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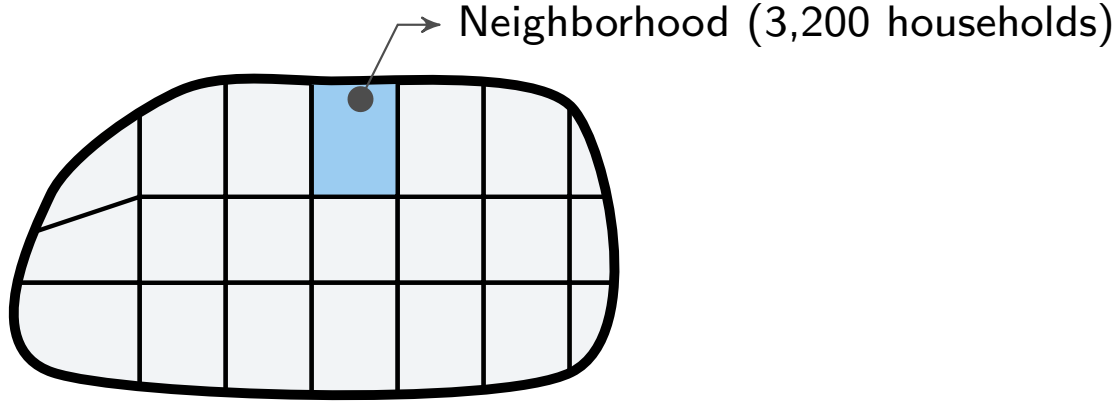

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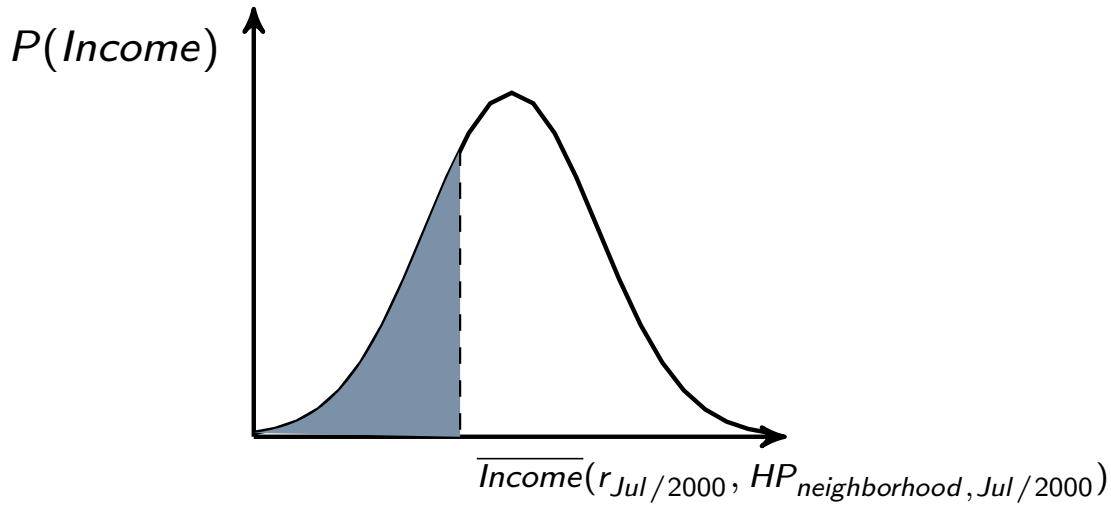

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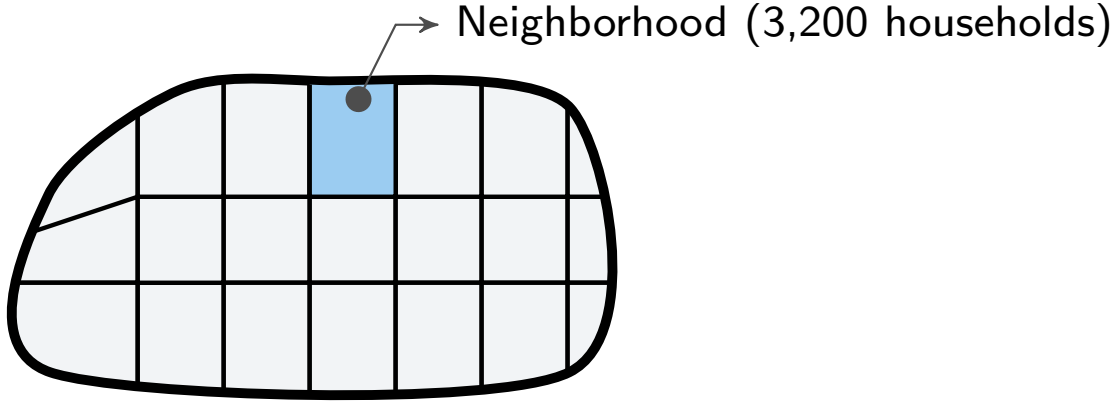

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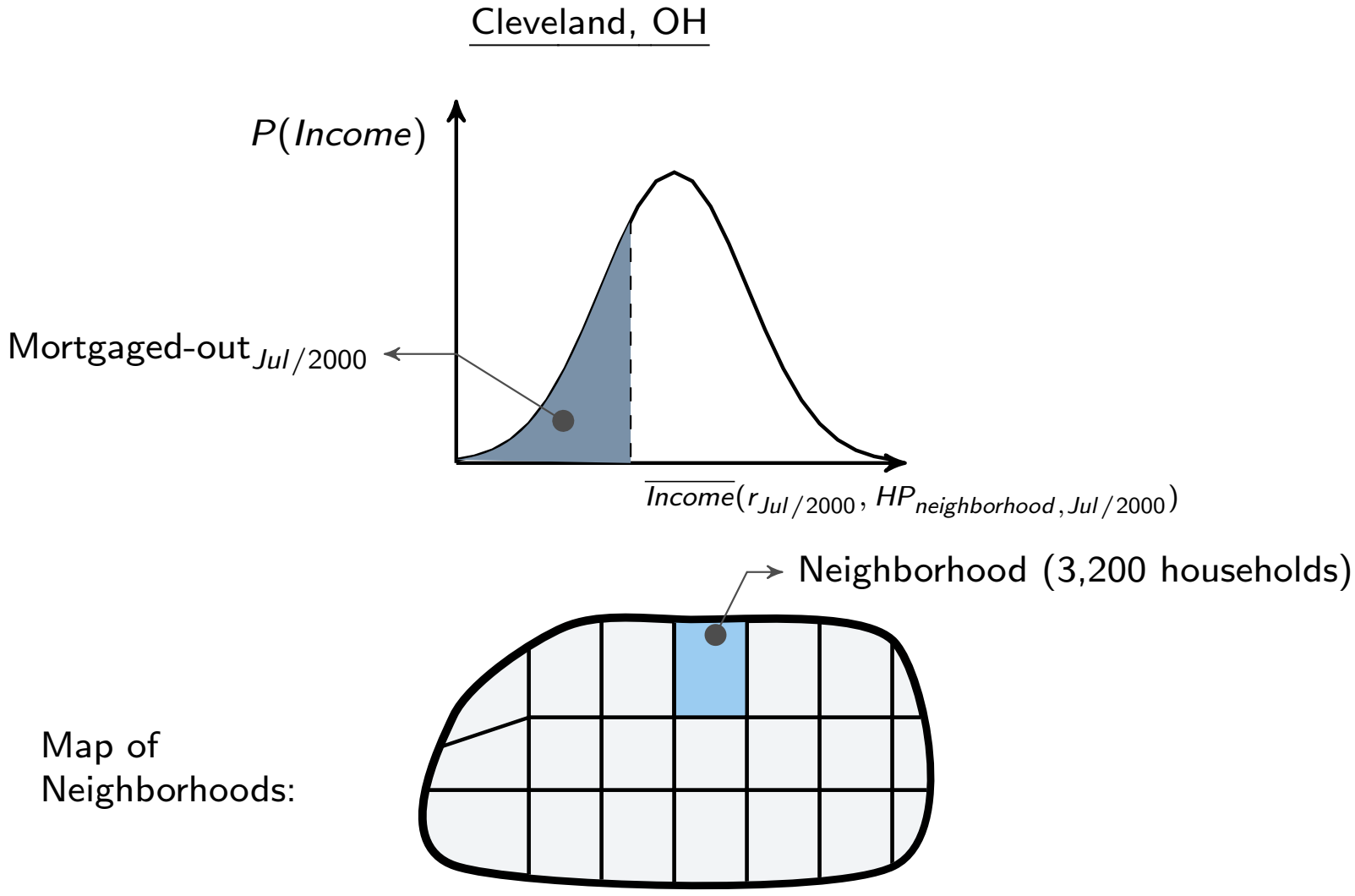

Empirical Design: Latent Demand

Now suppose that interest rates declined from $r_{Jul/2000}$ to $r_{Dec/2001}$.

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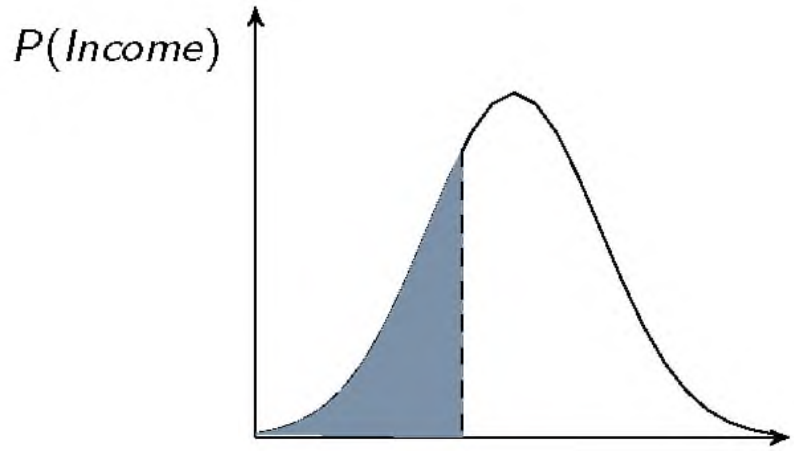

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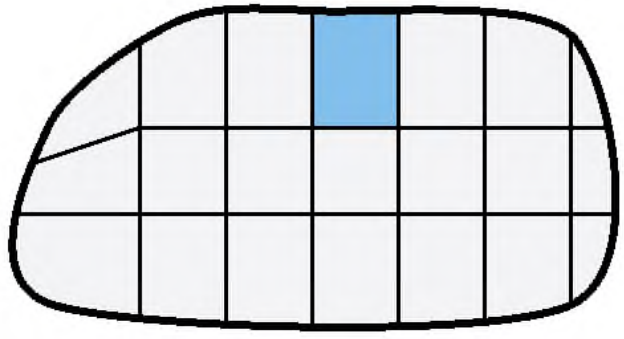

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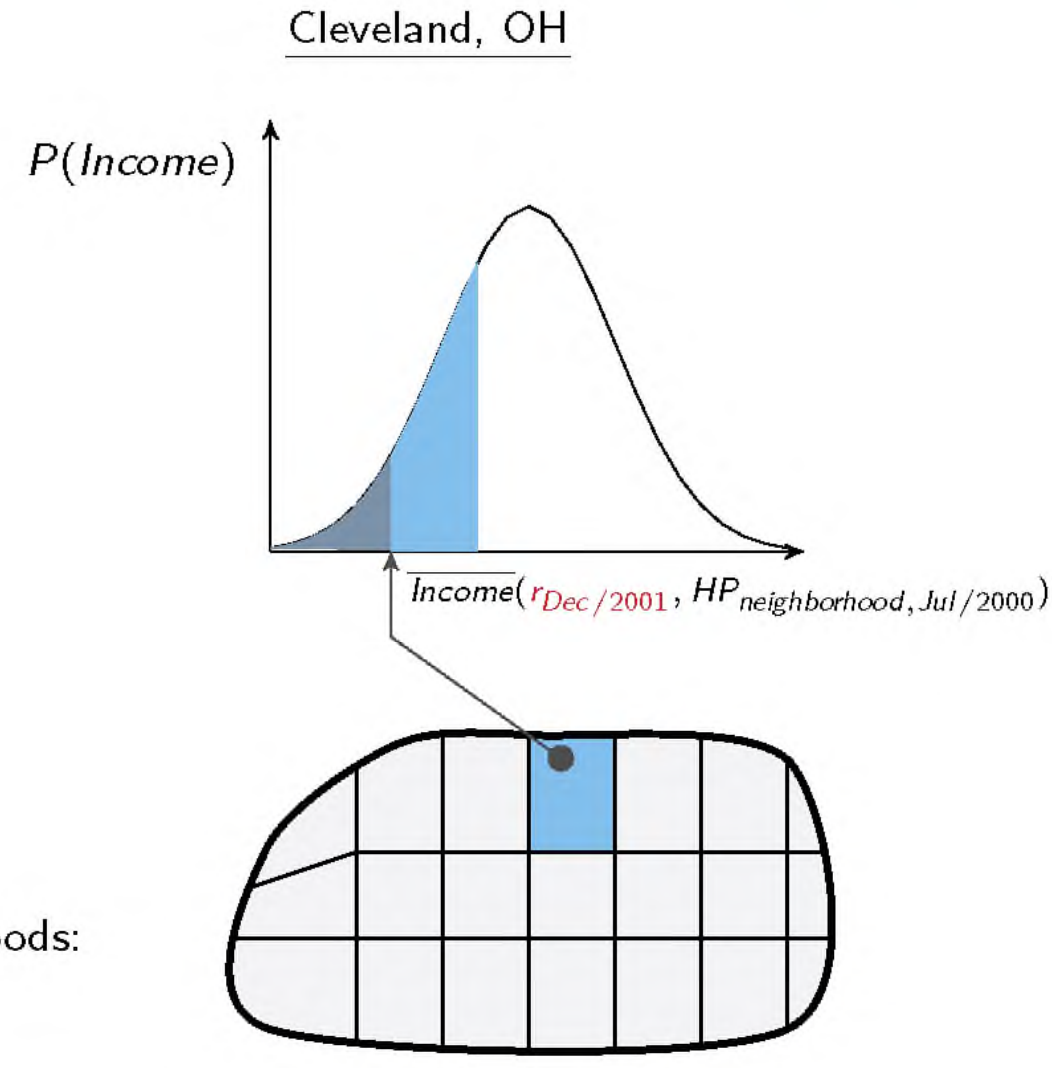

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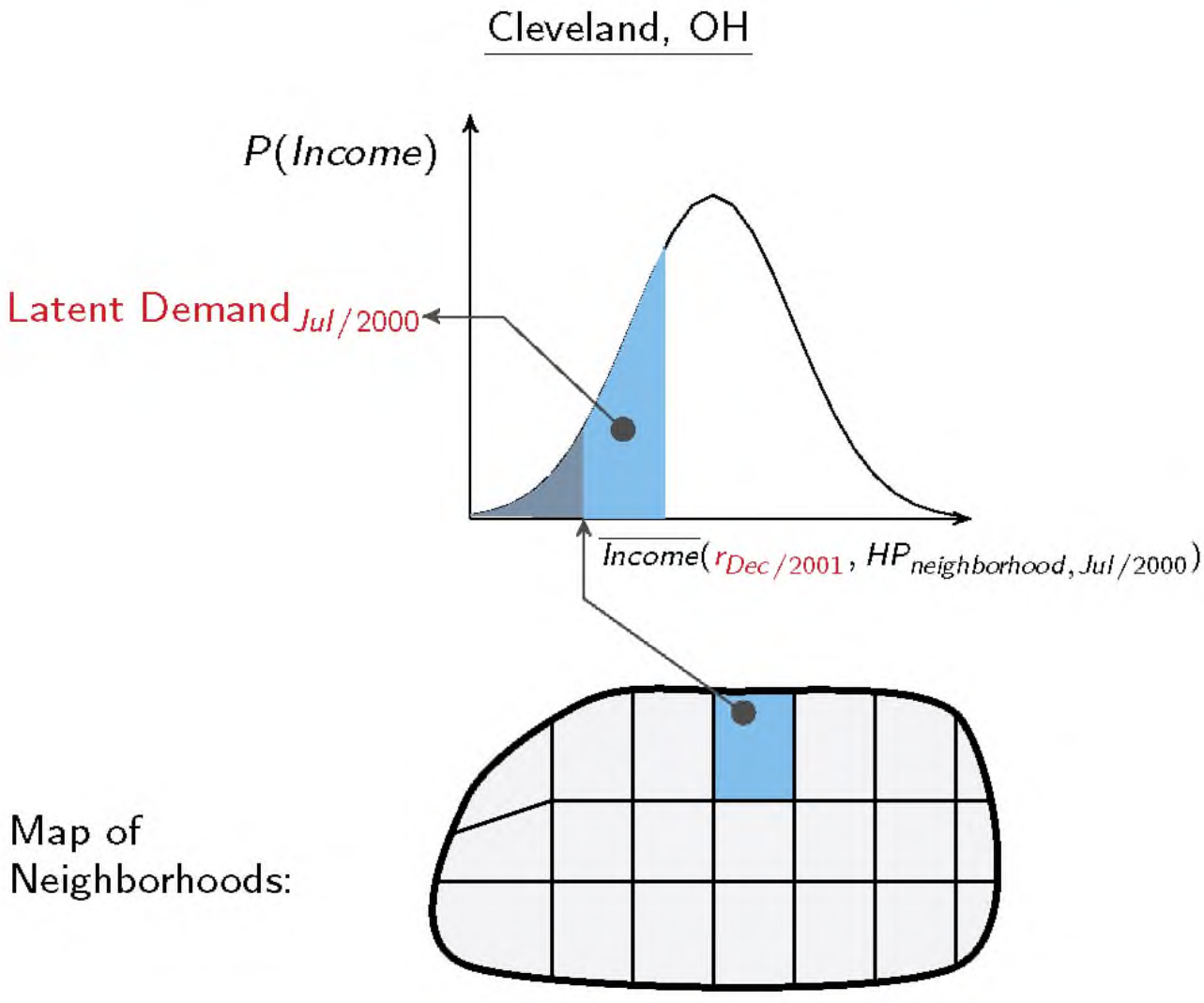
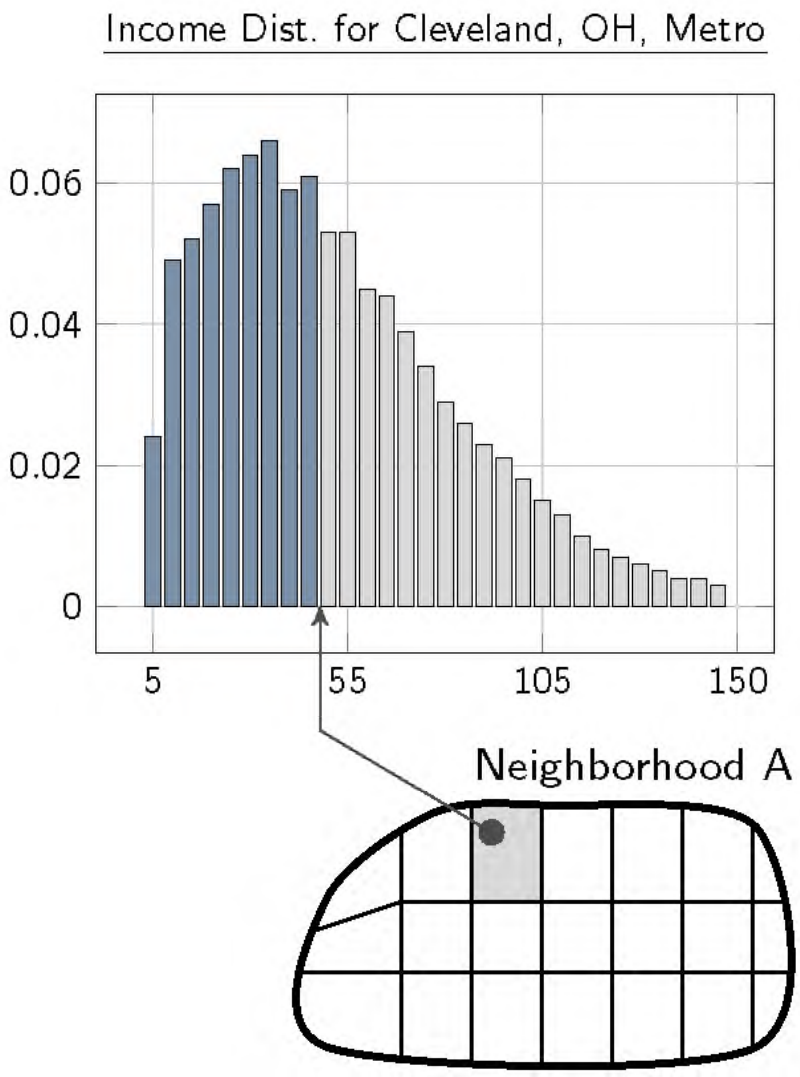


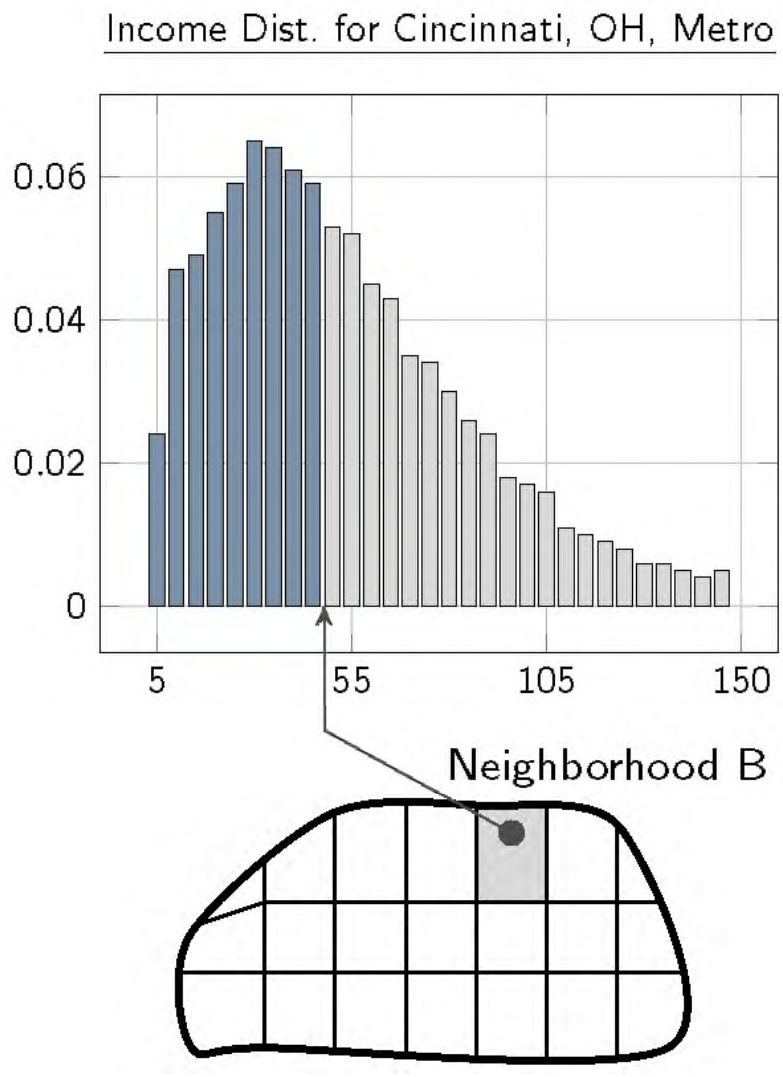
Empirical Design: Identification Strategy

Cleveland,OH and Cincinatti,OH are both metros with approximately 2.1M people, and with fairly similar demographics.

Empirical Design: Source of Variation

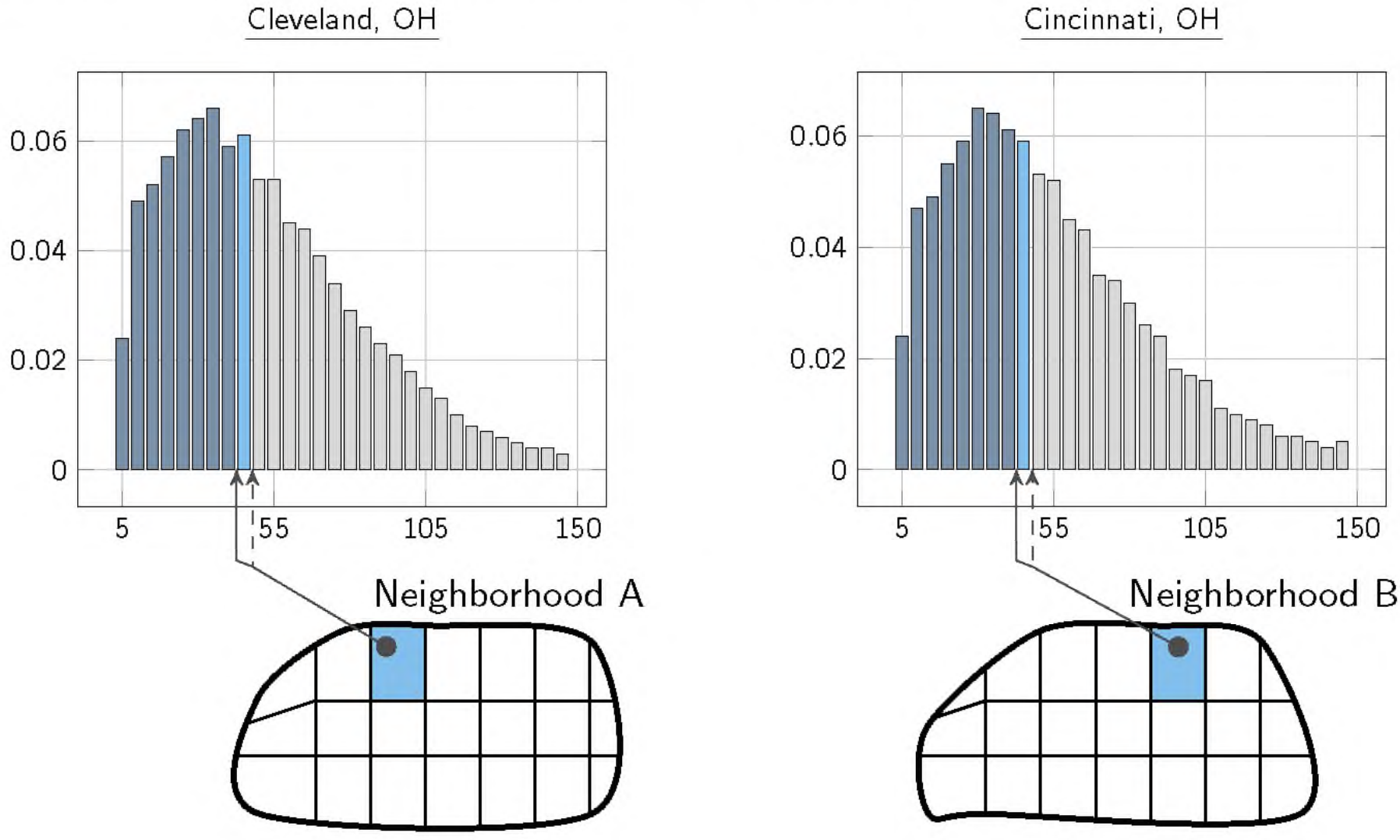
Consider neighborhood A in Cleveland, OH, and neighborhood B in Cincinnati, OH, that have the same Mortgaged-out$_{Jul/2000}$ and $HP_{neighborhood,Jul/2000}$. The dark blue area represents the mortgaged-out for each neighborhood in Jul/00.





Empirical Design: Source of Variation

Now, consider that interest rates declined from Jul/00 to Dec/01. The fraction of mortgaged-out will shrink and the households previously at the margin will now afford to live in the neighborhood. (light blue area)



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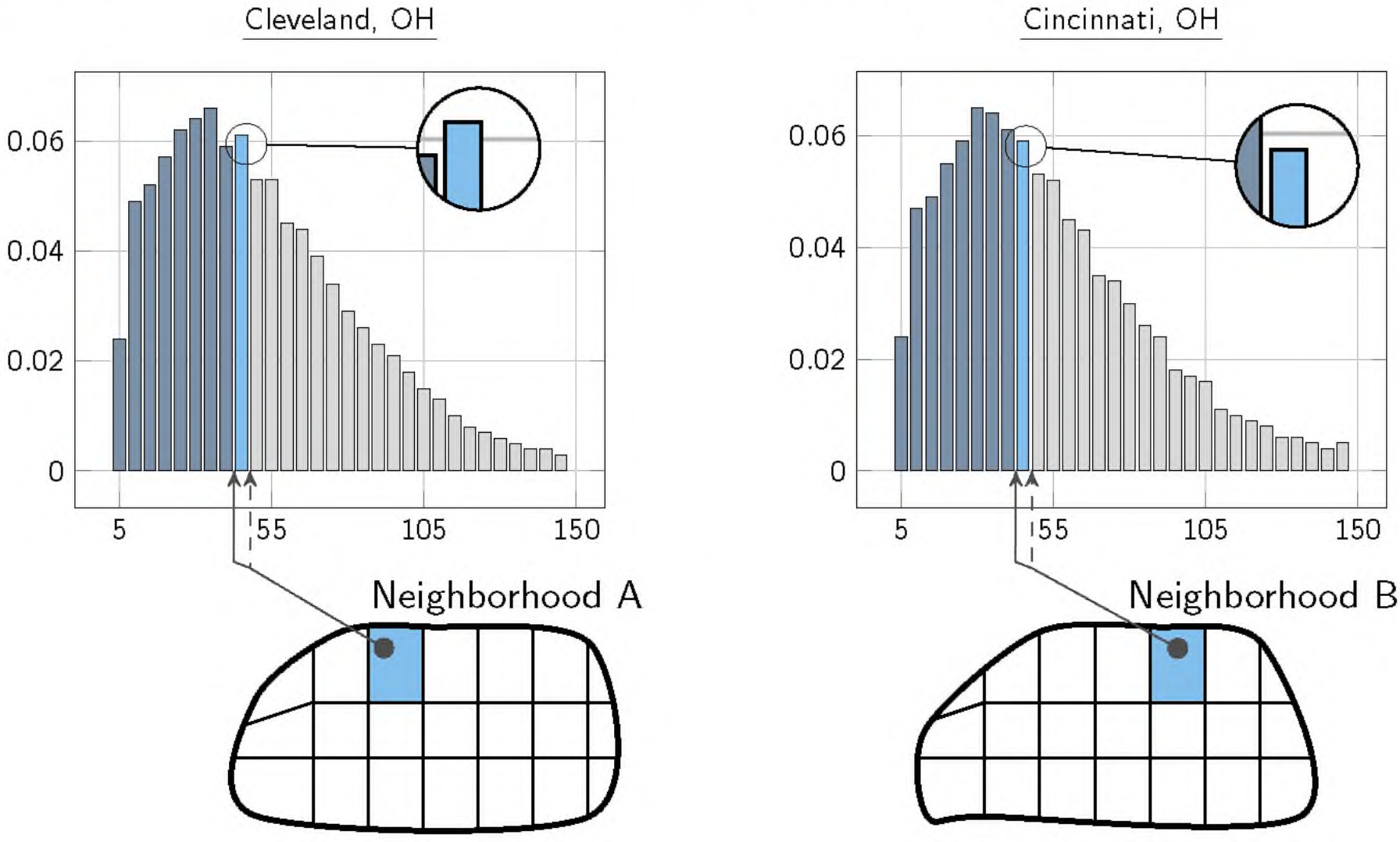


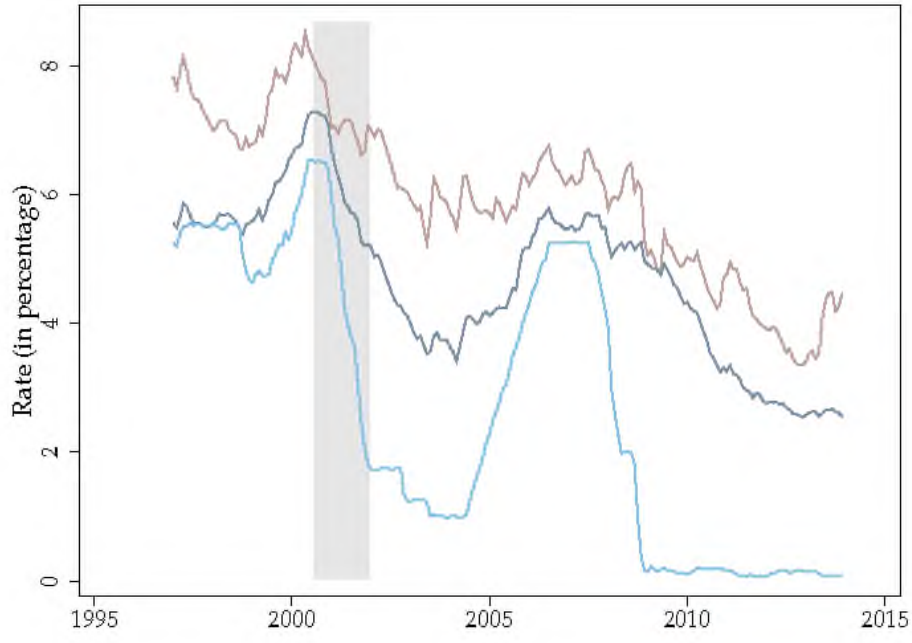
Empirical Design: Source of Variation

Can these small differences matter?

- In the example above, the difference between latent in neighborhood A and B equals 0.2% of the metropolitan population.
- For a metropolitan area with 2 million people, latent demand in neighborhood A is larger than latent demand in neighborhood B by 4,000 more people, approximately 1,800 households.
- A neighborhood has on average 7,000 people, roughly 3,200 households; thus the differences in latent demand might be relevant!

Change in Interest Rates from July 2000 to December 2001

- From July 2000 to Dec 2001, the fed funds rate declined from 6.54% to 1.82%. Main reasons for the monetary policy intervention were the 2001 economic recession and the geo-political uncertainty brought about by the 9/11 terrorist attacks. During the same period, the 30-year and 15-year mortgage fixed-rate fell by approximately 1.2% and 2%, respectively.



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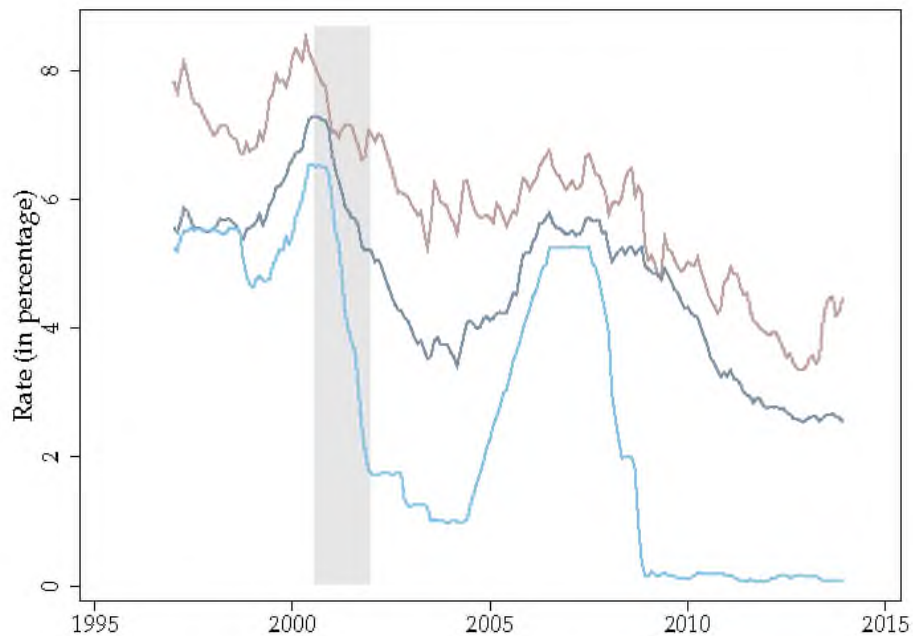

- Across neighborhoods, the average Renter's Mortgaged-out$_{Jul/2000}$ is 15%, and the average Renter's Latent Demand is 1.5%. Assuming 30-year fixed mortgages with 10% downpayment.

Conclusions

- Novel identification strategy that estimates latent demand for small neighborhoods based on an incidental differences in the distribution of metropolitan population.
- Using the monetary policy interventions between Jul-00 and Dec-01, I show that for a 1.2% declines in mortgage interest rates:
  - Homeowners in the lowest and highest income quintile experienced no gains in housing wealth;
  - In contrast, homeowners in the middle income quintiles experienced gains of 7% to 8.5% in housing wealth ($11,000 to $12,000).
- Limitation/Advantage. Study only one interest rate policy intervention.
- Limitation. Reduced form/partial equilibrium analysis. There are other channels that can affect housing wealth.