Neighborhood Price Externalities of Foreclosure Rehabilitation: An Examination of the Neighborhood Stabilization Program

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November 16, 2015

Introduction

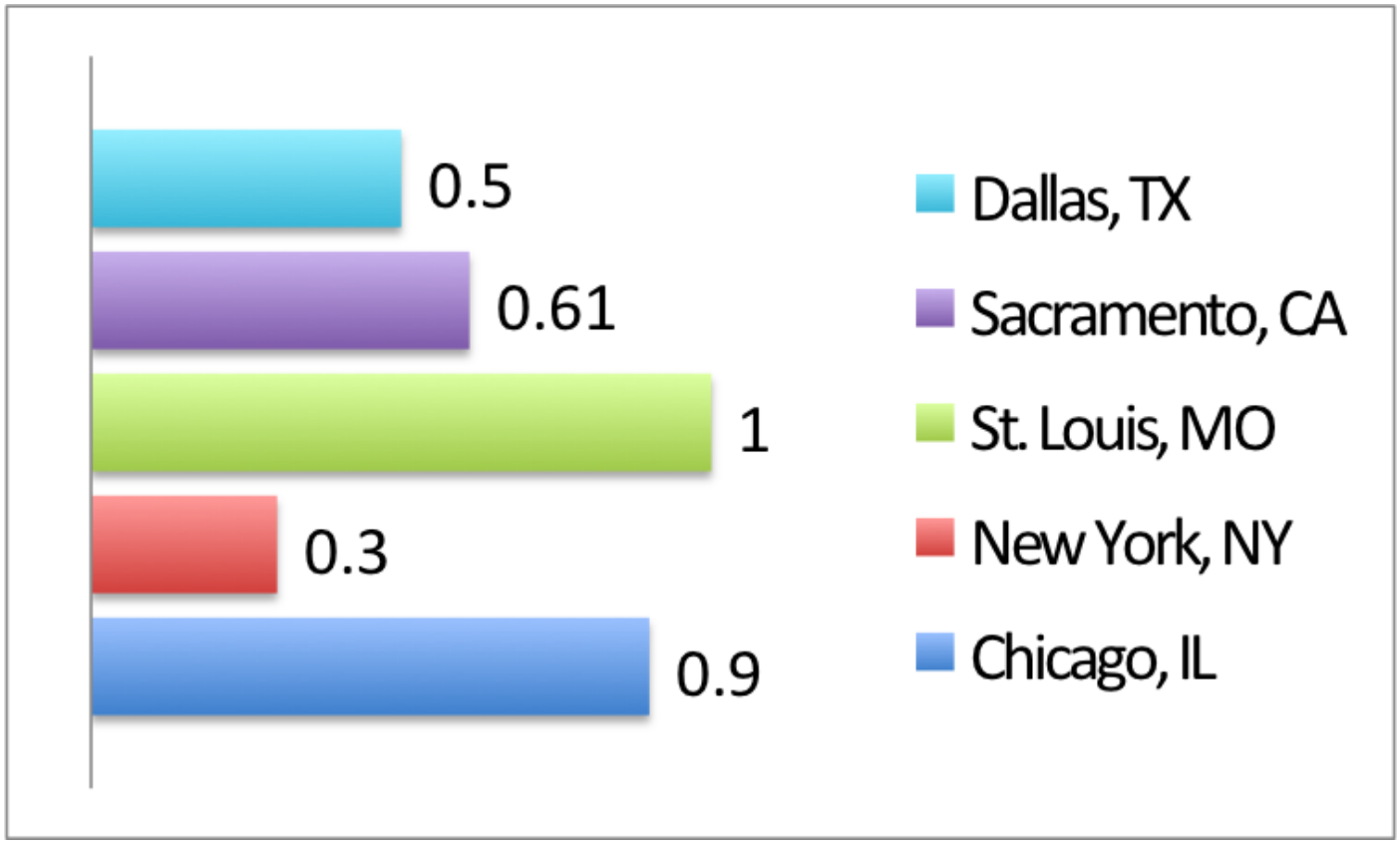
- **Market Failure**: Foreclosure activity peaked in the wake of the 2007-2009 Financial Recission
  - Foreclosures often clustered in low-income, minority neighborhoods
  - Foreclosures produced negative neighborhood price externalities
- **Policy response**: public funds to rehabilitate foreclosed properties
  - Neighborhood Stabilization Program (NSP) provides funds to local agencies to acquire and rehabilitate properties
  - Focus on foreclosed properties in low-income neighborhoods

What were the neighborhood effects of the NSP funding?

Foreclosure Externalities

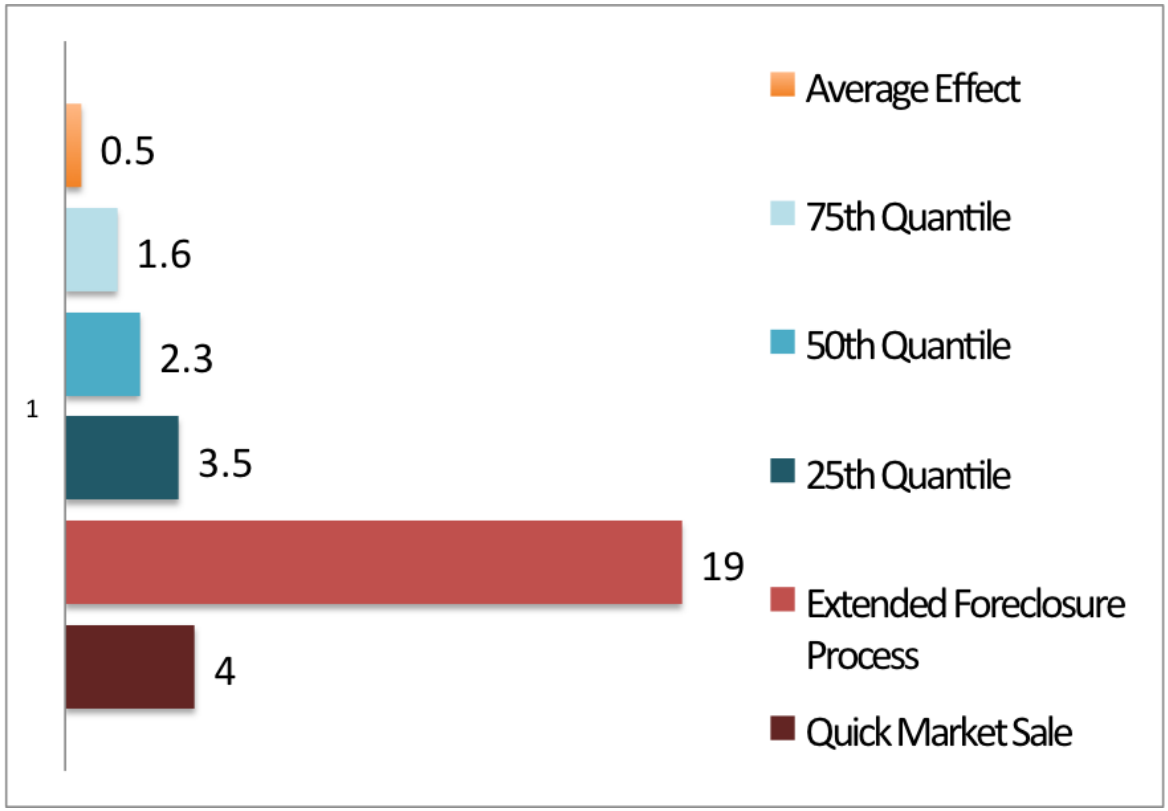
- Robust literature documenting negative price impacts of neighborhood foreclosures ranging from 1% - 9% of home value (Lee, 2008)
  - Consensus: effects are very local–usually within $\approx$ 200m
  - Varied estimated externality effect sizes

Estimated Decrease in Neighborhood Home Prices within ≈ 200m of Foreclosed Properties



Harding et al. (2009); Immergluck and Smith (2006); Leonard and Murdoch (2009); Rogers and Winter (2009); Schuetz et al. (2008);

Negative Neighborhood Price Externalities Also Vary Within A Single Market



Leonard and Murdoch (2009); Zhang and Leonard (2014); Zhang et al. (2015)

* Average effect averages across foreclosures and time;
other effects are maximum effect in 0-6 months after foreclosure

Mechanisms Driving Foreclosure Externalities

1. **Blight**
   - NSP-funding targeted at removing blight
   - When will neighborhood prices respond?... *expectations of* or *actual* blight reduction?
2. **Valuation**
   - Foreclosed properties sell at a discount
   - Rehabilitated properties expected to sell at market
   - Valuation channel should decay rapidly over time
3. **Supply**
   - Both foreclosed homes and rehabilitated properties increase housing supply
   - Negative price externalities that decay rapidly over time expected in both cases.

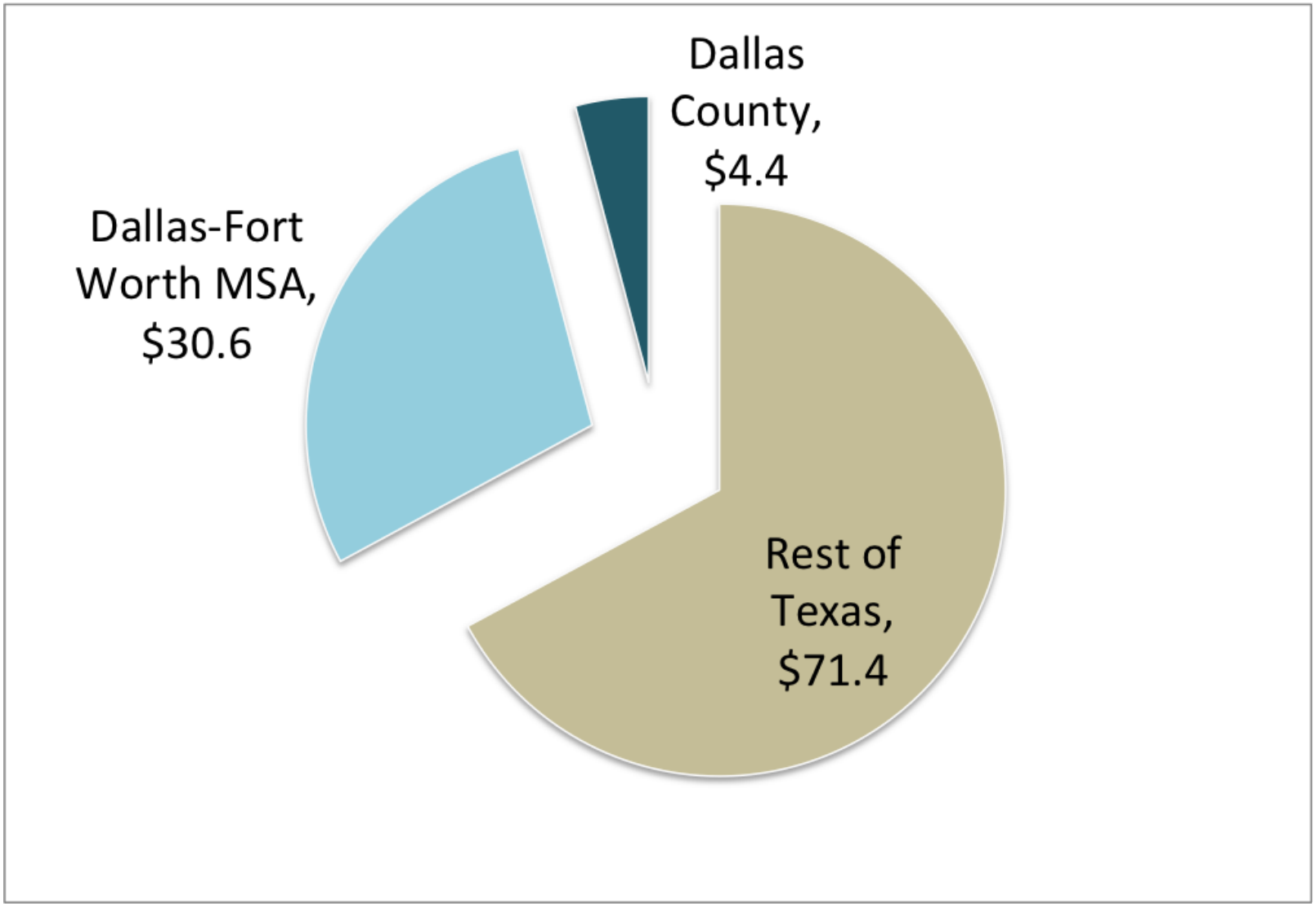
Neighborhood Stabalization Program (NSP)

- **Funds must go to neighborhoods where foreclosures and vacancies were severe**: Foreclosure risk score data part of requirement for NSP2 and 3.
- **Funds must go to low-income households and neighborhoods**: required to target households making below 120% of Area Median Income (AMI), with at least 25% of funds allocated to households making less than 50% of AMI.
- **Funded programs varied**: home financing (e.g., down payment assistance), acquisition and rehabilitation, and land banking

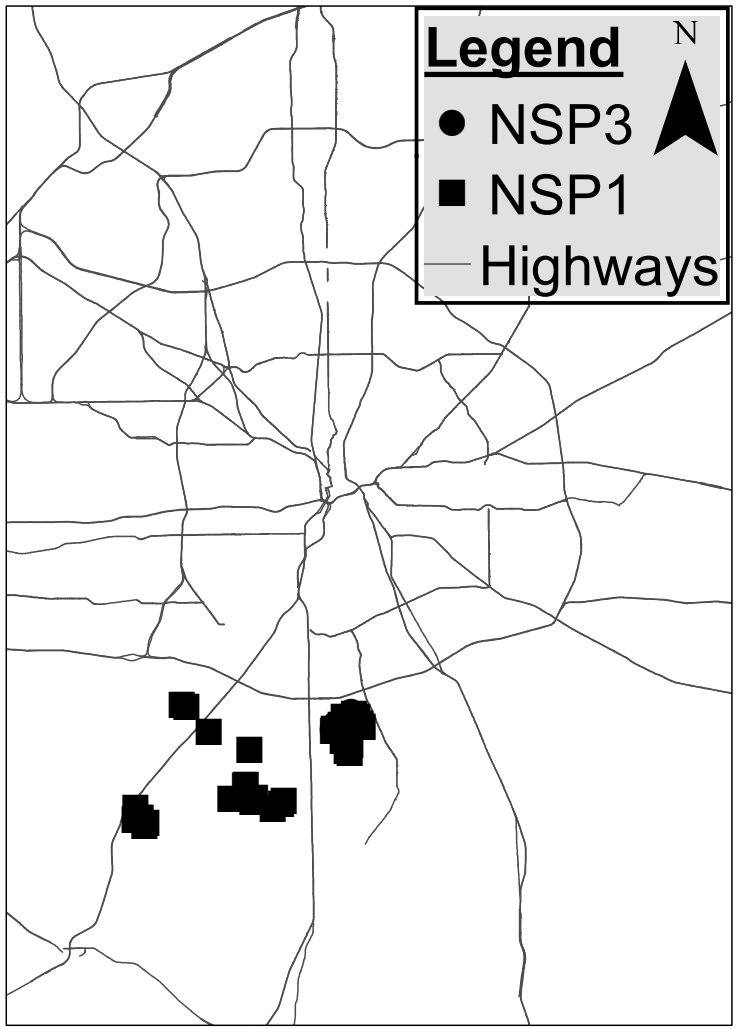
NSP was rolled out in 3 phases and included $\sim$ $7 billion in funding

- **NSP1**: Part of the Housing and Economics Recovery Act (HERA) and allocated $3.92 billion beginning in *July 2008*;
- Funds were distributed among 309 local and state government entities.
- NSP2: Part of the American Recovery and Reinvestment Act, provided an additional $1.93 billion which was dispersed to 56 grantees in *January 2009*.
- **NSP3**: Part of the Dodd-Frank Financial Reform Bill, an additional $1 billion was distributed among 270 state and local agencies through NSP3 in *September 2010*.

NSP1 Provided $102 Million to Texas



NSP-Properties Rehabilitated by Habitat for Humanity



Properties were Highly Clustered

(Southwestern Cluster)

Data

- **NSP Data**: 48 Properties (37 from NSP1 and 11 from NSP2)
  - dates of acquisition and sell of the rehabilitated property
  - type of rehabilitation work completed
- **Market Sales**: 2006 through 2013
  - temporally and geographically matched to NSP-properties
  - 2201 sales within 0.25 miles of NSP-properties
- **Neighborhood Characterists**
  - ACS 2006-2010 5-year estimates
  - Proximity to neighborhood foreclosure sales
  - Historical neighborhood price trends

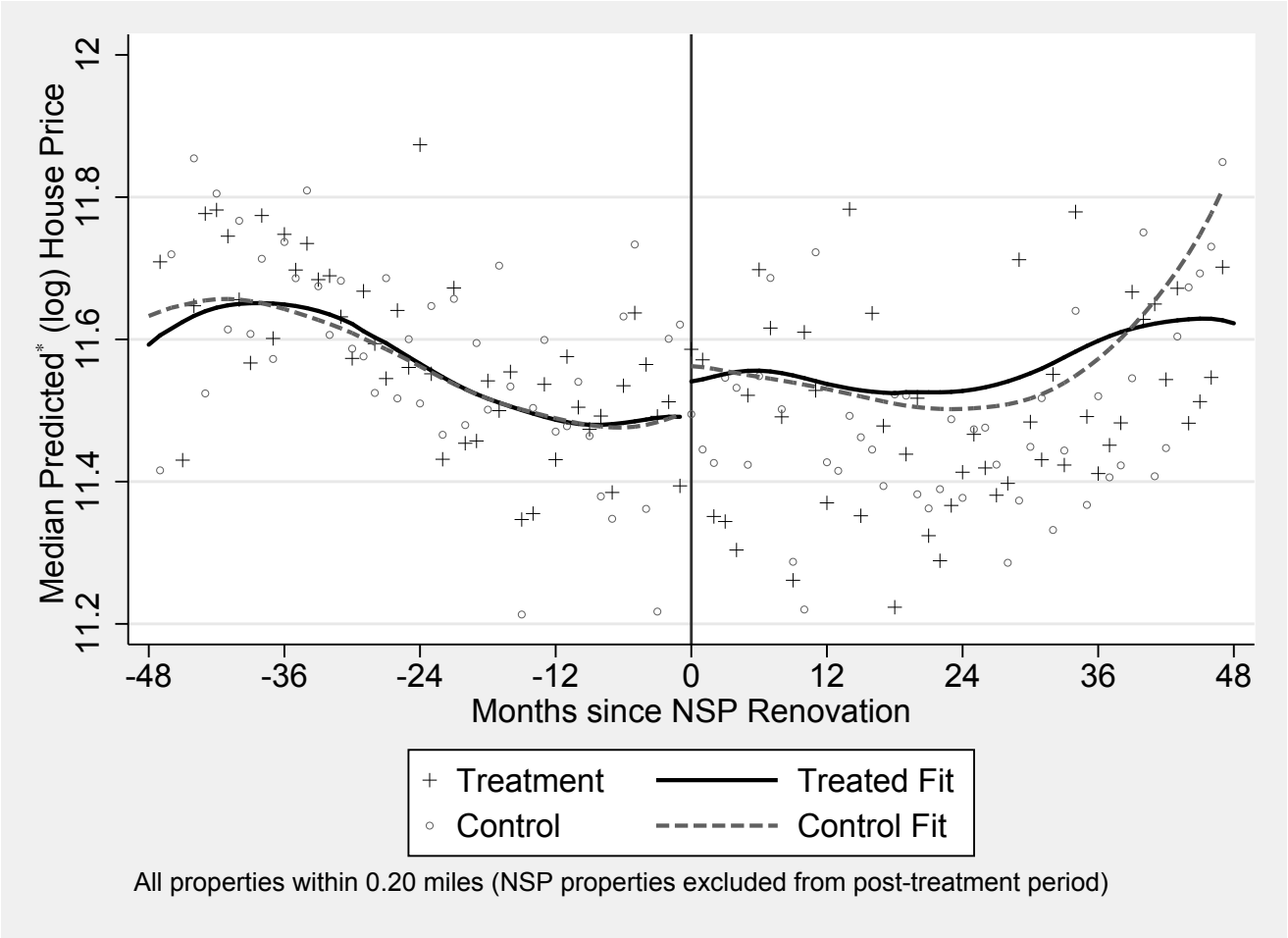
Difference-in-difference Framework

- Goal: Compare change in home prices before and after NSP-funded rehabilitation across "treatment" and "control" neighborhoods

$$\text{NSP Effect} =$$
$$[P_{treat,after} - P_{treat,before}] - [P_{control,after} - P_{control,before}]$$

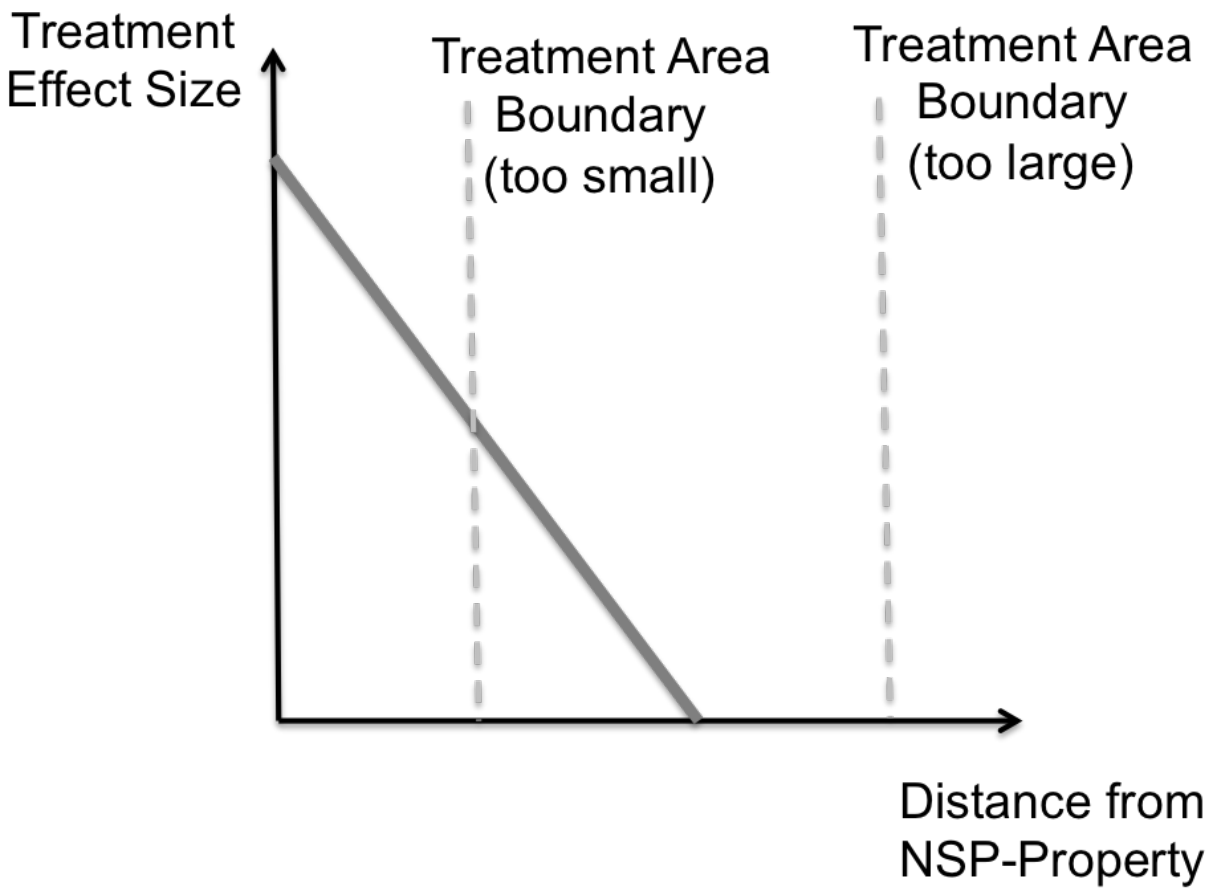
- Challenges
  - Non-random assignment of treatment
  - Unknown geographic extent of treatment effects

Similar Price Trends Before NSP-funded Rehabilitation in Treatment & Control Neighborhoods



All properties within 0.20 miles (NSP properties excluded from post-treatment period)

Unknown Geographic Extent of Treatment Effects

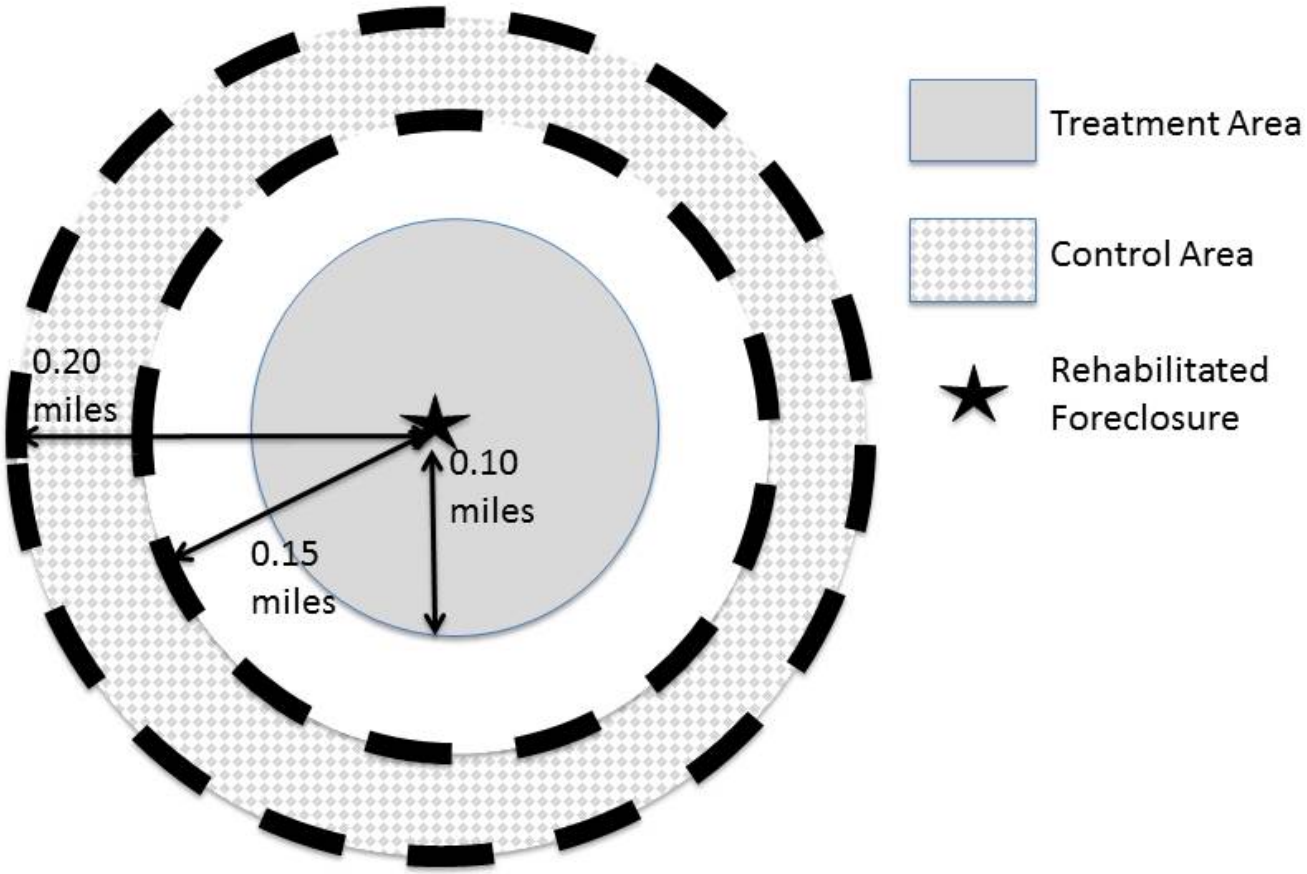


Difference-in-difference

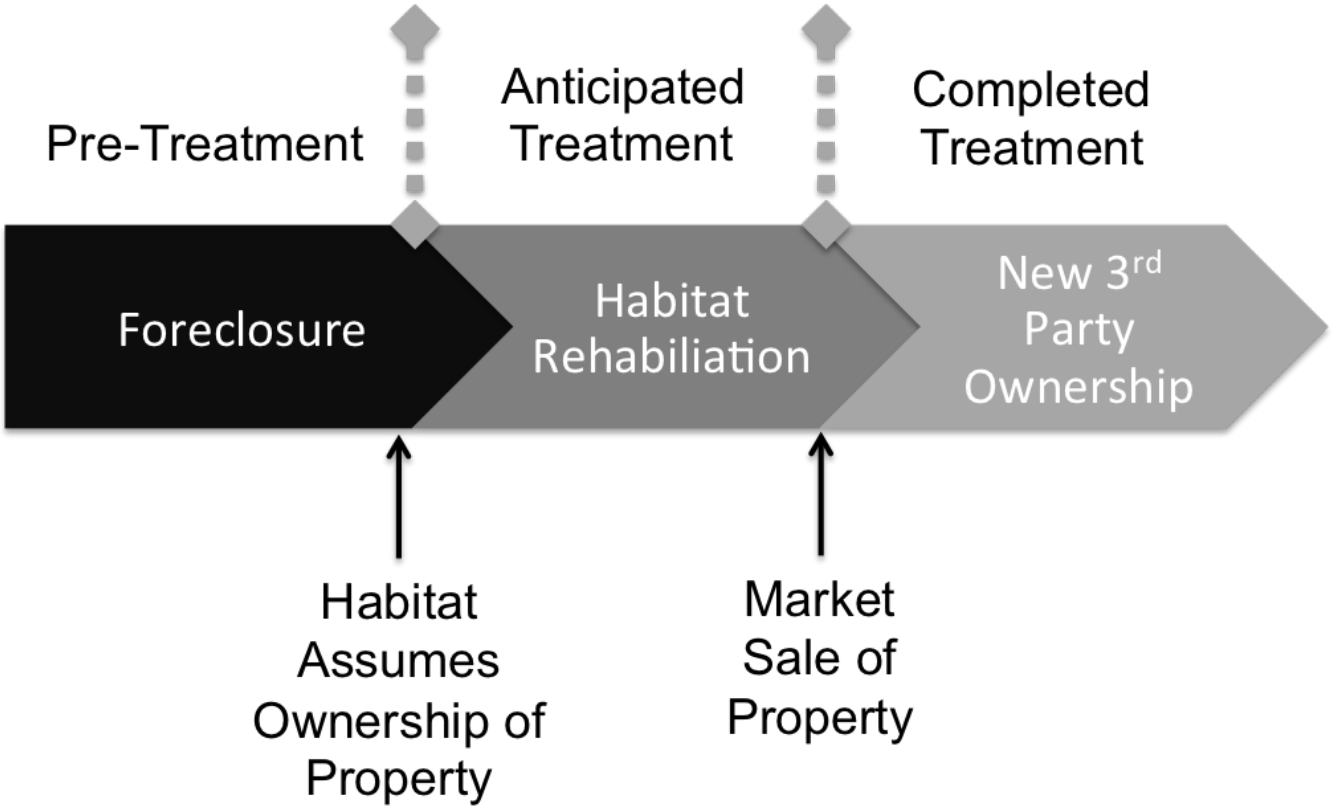
$$Y_{it} = \alpha + \beta Z_{it} + \gamma \, Treatment_i + \tau \, After_t + \theta \, Treatment_i * After_t + \epsilon_{it}$$

- Z_{it} is matrix of controls
  - Housing Characteristics
  - Year and Month Fixed Effects
  - Neighborhood Characteristics
- *Treatment* identifies houses near to NSP-property
- *After* identifies observations occurring after NSP-funded intervention
- **θ is the DID estimator**

Treatment Assignment–Baseline Models



After Assignment–Baseline Models



Treatment Period set at 12 months in Baseline Models.

"Anticipated Treatment" Effects–Baseline Models

	Model 3	**Interior Renovation Only**	**Exterior Renovation Only**
Treatment	-0.147	0.020	0.023
	(0.154)	(0.084)	(0.059)
After	0.082*	0.055	0.056
	(0.041)	(0.062)	(0.065)
*Treatment*After*	-0.011	-0.161	0.042
	(0.046)	(0.109)	(0.070)
Observations	171	100	134
R-squared	0.867	0.917	0.897

Standard errors clustered at census tract-year level (in parentheses).

"Completed Treatment" Effects–Baseline Models

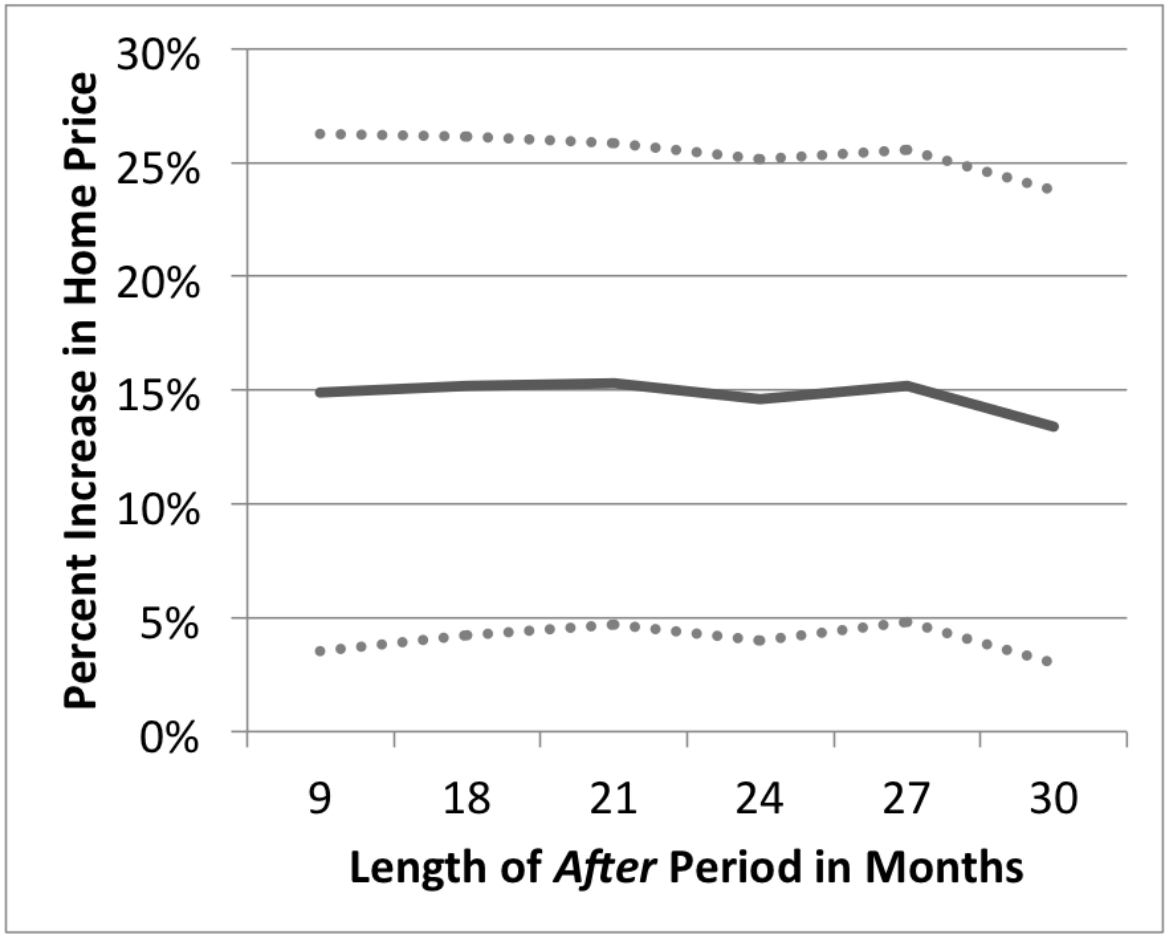
	Model 3	**Interior Renovation Only**	**Exterior Renovation Only**
Treatment	-0.109	-0.036	0.103
	(0.131)	(0.113)	(0.065)
After	-0.221**	-0.159***	-0.220***
	(0.080)	(0.051)	(0.072)
*Treatment*After*	0.153**	0.149	0.162**
	(0.061)	(0.243)	(0.072)
Observations	138	81	110
R-squared	0.893	0.936	0.918

Standard errors clustered at census tract-year level (in parentheses).

Temporal Decay of Treatment Effects

Length of *After* period in months	<= 9	<= 18	<= 24	<= 27	<= 30
Treatment$^{\diamondsuit}$	-0.177	-0.140	-0.155	-0.162	-0.137
	(0.126)	(0.123)	(0.112)	(0.107)	(0.113)
After$^{\diamondsuit\diamondsuit}$	-0.227**	-0.210***	-0.195***	-0.195***	-0.184***
	(0.082)	(0.073)	(0.063)	(0.062)	(0.059)
*Treatment*After*	0.149**	0.152**	0.146**	0.152***	0.134**
	(0.058)	(0.056)	(0.054)	(0.053)	(0.053)
Observations	132	144	150	153	158
R-squared	0.895	0.896	0.899	0.901	0.902

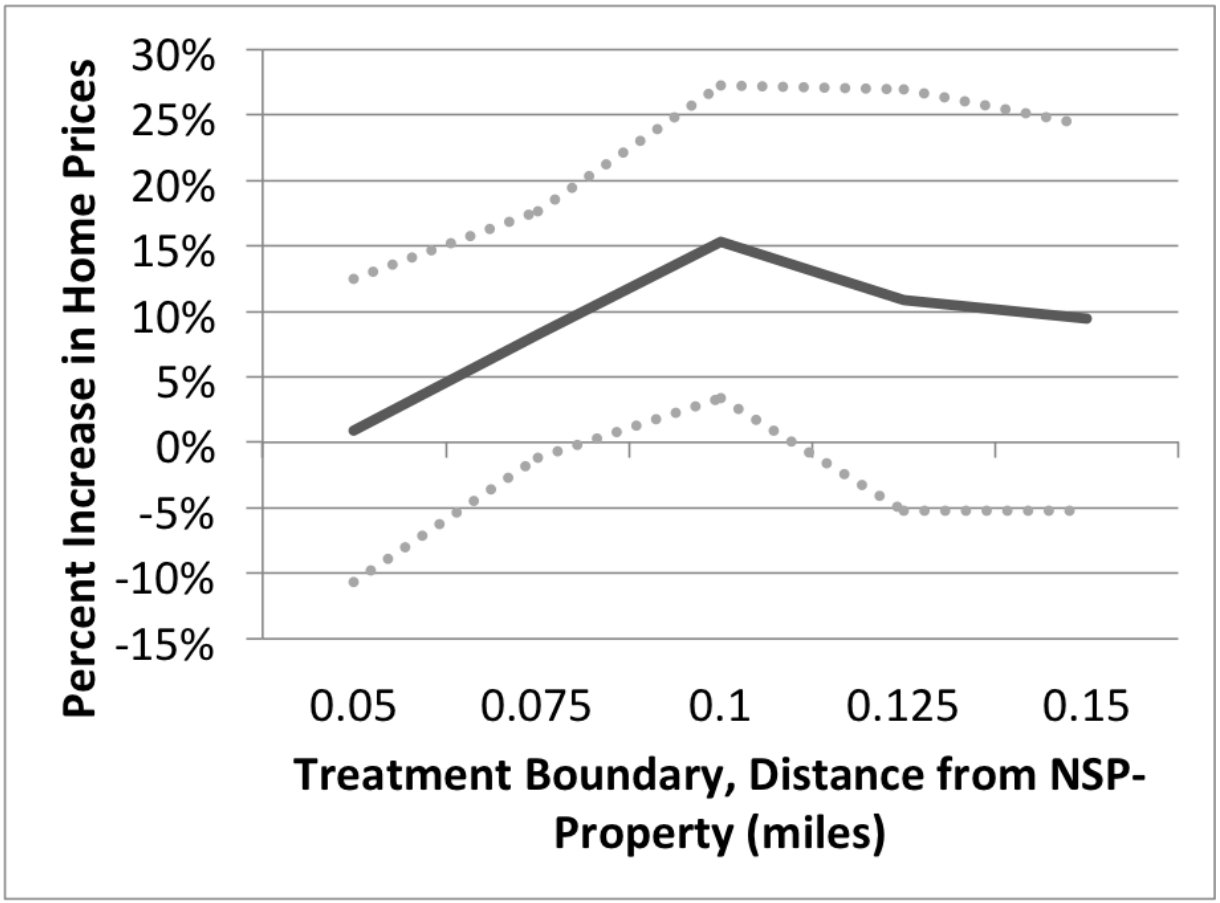
Temporal Decay of Treatment Effects (95% Confidence Interval)



Varying Size of Treatment Area

Treatment Radius (miles)	0.05	0.075	0.10	0.125	0.15
Treatment	0.326	-0.334	-0.109	0.062	0.012
	(0.798)	(0.274)	(0.131)	(0.078)	(0.039)
After	-0.201**	-0.211***	-0.221**	-0.165**	-0.152*
	(0.074)	(0.071)	(0.080)	(0.075)	(0.077)
*Treatment*After*	0.009	0.082	0.153**	0.109	0.095
	(0.059)	(0.048)	(0.061)	(0.082)	(0.075)
Observations	85	112	138	174	209
R-squared	0.940	0.907	0.893	0.869	0.865

Varying Treatment and Control Radius



Limitations

- **External Validity**: One county and one non-profit agency
  - Other authors found no price effects in multi-county studies (Schuetz et al., 2015)
  - Because implementation varied widely across the country, no "average" treatment effects exist.

- **Omitted Variables**: Failure to account for other NSP activity and other unobserved neighborhood characteristics
  - Results robust to census tract fixed effects

Conclusions–Magnitude of Neighborhood Price Externalities

Evidence for effective targeting of NSP funding.

- 15% price increase for properties within 0.1 miles (528 feet) of an NSP-property
- Effects last for up to 30 months after the NSP sale
- Magnitude is comparable to the largest negative price impacts associated with Dallas County foreclosures
- Duration is much longer

Conclusions–Mechanisms

Remediation of exterior property blight produced the large and long-lasting neighborhood price effects.

- Effects were long-lasting and largest considering properties receiving exterior repairs.
- Valuation channel cannot be ruled out, but long-lasting effects suggest the blight mechanism.
- Supply channel cannot be ruled out–potential downward bias of estimated treatment effects.

Conclusions–Aggregate Price Impact

"Rough" Assessment of Public Benefits of NSP-funding

- Assumptions:
  - $109,000 average home price
  - 15% price increase
  - 79 homes in treated area of each NSP property
- $5.8 million in NSP funding produced **$60.7 million in property price increases**
- If property prices are realized in property appraisals, assuming a 2% property tax rate, NSP-funding had potential to create **$1.2 million in additional tax receipts**.
- BUT...property appraisals don't always fully reflect temporary price adjustments...

Thank You !

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