Homeownership, Labor Supply, and Neighborhood Quality

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July 24, 2020

Motivation

- Governments spend billions incentivizing homeownership (US 0.5% GDP)
  - Tax subsidies (primarily benefit the rich (Poterba and Sinai 2008))
  - Home purchase subsidies to the poor (FHFA loans) or other non-owners (Help-to-Buy)
  - Public housing privatizations (Sodini et al. 2016)
- Justification: private financial benefits for owners, positive externalities of homeownership for communities
- RQ: Does homeownership promote household and neighborhood success?
- Find: pos effect on household labor supply and neighborhood home prices
- Selection into homeownership makes effects difficult to identify.
  - Owners are richer, more educated, older, whiter, etc. than renters
  - Observable and unobservable characteristics of residents and the housing stock vary with homeownership (cross-section, panel)
- Limited causal evidence, esp. on external effects.

Overview of paper

- Use public housing privatization in Israel: units sold to sitting tenants
  - Large changes in homeownership rates in certain locations
    - Residents and housing stock remain constant
  - Variation in government-set sale price discounts for identification
    - Intertemporal (2005 increase), cross-sectional
    - Discounts affect purchases at the household level
- Measure effects of homeownership on
  - Household labor supply – behavioral change in transition
  - Neighborhood quality (always-private housing prices)
  - Mechanisms (besides LS):
    - School quality and young population share
    - Civic engagement (voting)
    - Renovations (wealth effect?)
    - Residential stability

Neighborhood externalities of homeownership

- Potential externalities of ownership derive from two sources:
  - Owner-occupiers benefit from appreciation in property value
  - Owner-occupiers are more locationally stable than renters
- Incentives to boost property value (amenity capitalization) may lead to
  - Investment in physical appearance of the home and surroundings

    (Henderson and Ioannides 1983; Galster 1983; DiPasquale and Glaeser 1999; Harding et al. 2000)
  - Efforts to reduce crime, improve schools (PTA)
  - E.g. renovations, gardening, (guns), neighborhood watch, voting
- Greater locational stability may lead to
  - More community engagement, social and civic capital, voting

    (DiPasquale and Glaeser 1999; Engelhardt et al. 2010; Hilber 2010; Ahlfeldt and Maennig 2015)
  - Better outcomes for own and neighborhood children

    (Green and White 1997; Haurin et al. 2002; Aaronson 2000; Galster et al. 2007; Gibbons et al 2017)
- Longer horizon in home reinforces property value incentives

Homeownership and labor supply

- Inc and subst effects from subsidy (ALL such programs subsidize)
  - Inc: Discounted purchase, wealthier $\rightarrow$ work less
  - Subst: Each dollar buys more house
- Households may increase their labor supply
  - To finance purchase; Sodini et al. (2016): LS effect grows with debt
  - To avoid default
  - Asset ownership increases stake in financial health (Jha and Shayo 2019)
- Privatization context: means testing $\rightarrow$ LS constraint
- Labor supply can directly affect neighborhood quality.
  - Working role models; welfare to working-class shift
  - Default prevention (Campbell et al. 2011)
  - Property-tax compliance (Arbel et al. 2017)
- Generally, many possible mechanisms of neighborhood externalities

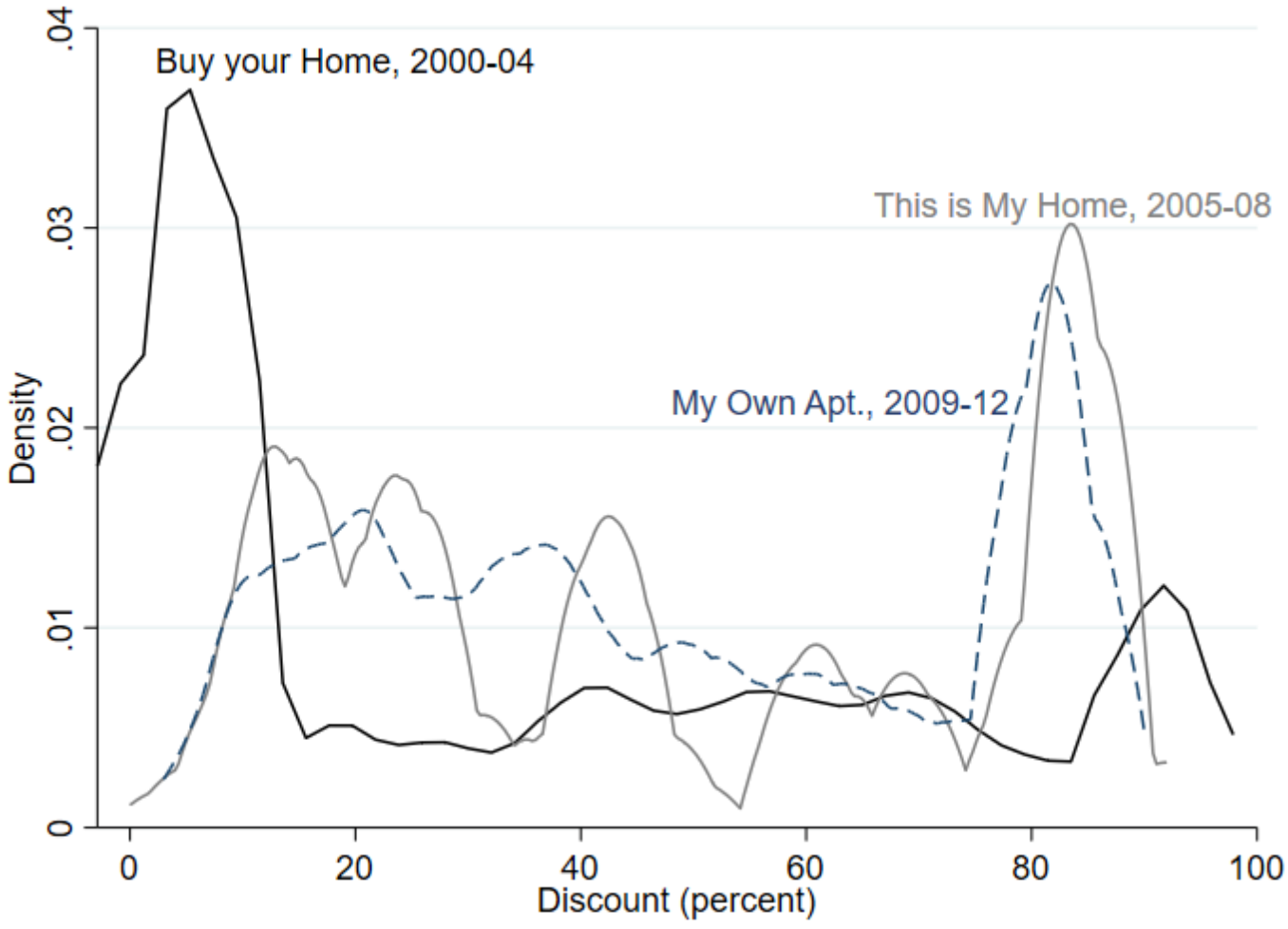
Existing evidence on neighborhood externalities

- Advantage of direct approach: prices summarize local externalities (house price capitalization of local amenities)
- No estimates using a natural/real experiment or quasi-random variation.
- State-of-the-art provides bounds between neg. and large, pos. effects
  - Coulson and Li (2013): panel data with neighborhood FE
    - Residents evolve with HR over time (upward bias)
    - Housing values self-reported (likely attenuation bias)
  - Kortelainen and Saarimaa (2015): negative/no effect
    - IV: number of units per building (downward bias)
    - Corr with density, neighborhood unobservables, and externality (!)

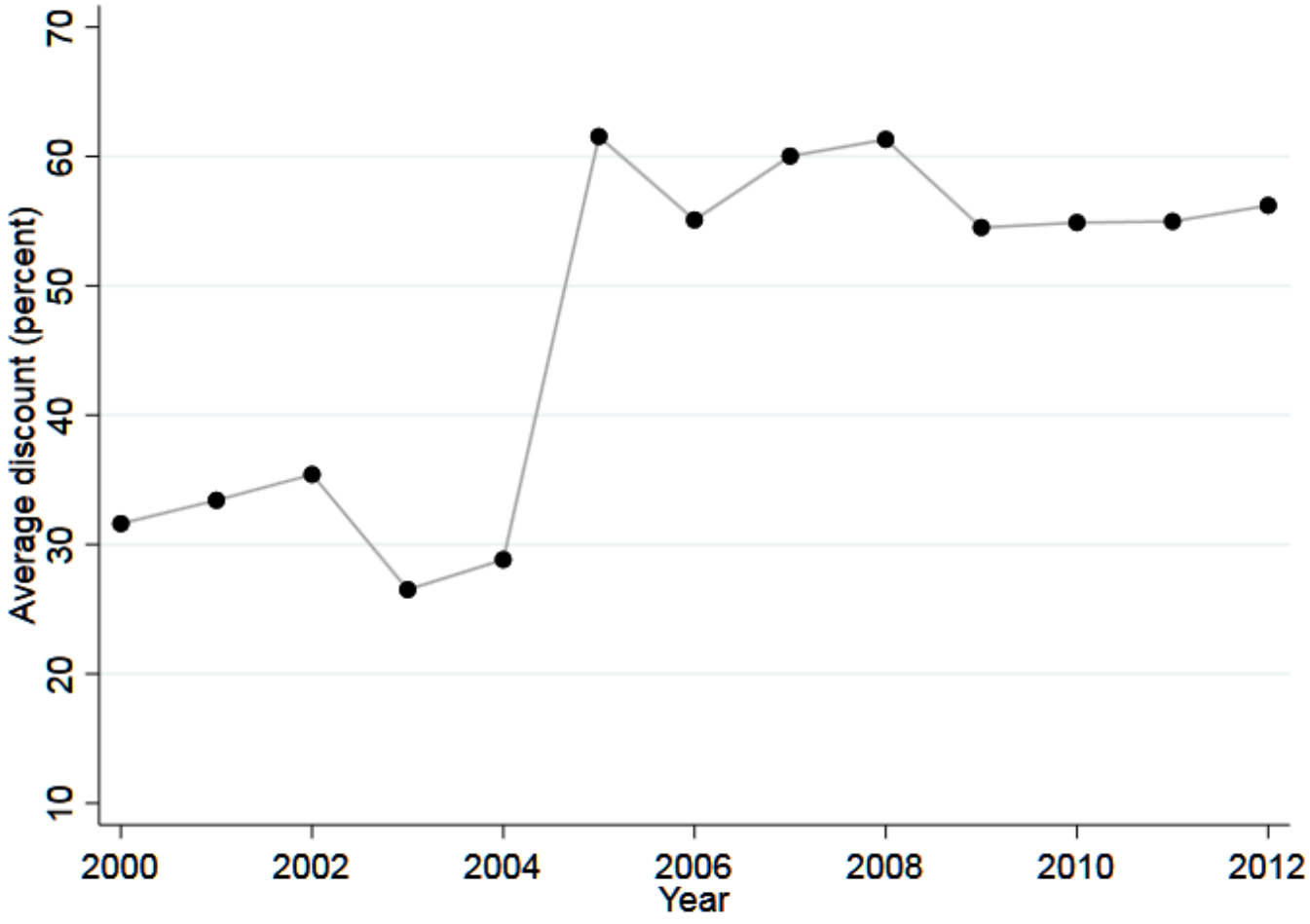
Setting: Israeli Public Housing Privatization and the Discount Instrument

- Steady privatization at modest discounts (25%) through 1980s, 90s
- 1998 law: increase privatization; discounts rise to up to 85%
  - Implemented ad hoc, new rules set each year (Arbel et al. 2014)
  - Large increase in discounts implemented in 2005
  - Discounts determined by government formula (region, marital status, num. children, type of rental contract, disability, **tenure in public housing**)
  - Take advantage of discontinuities across plausibly exogenous margins: e.g. 2/3 children; 5/6 and 11/12 yrs tenure

Distribution of Discounts by Sale Period



Avg. Discount by Year: Family with 3+ Children



Public Housing Homeownership Rate, 2000-2012

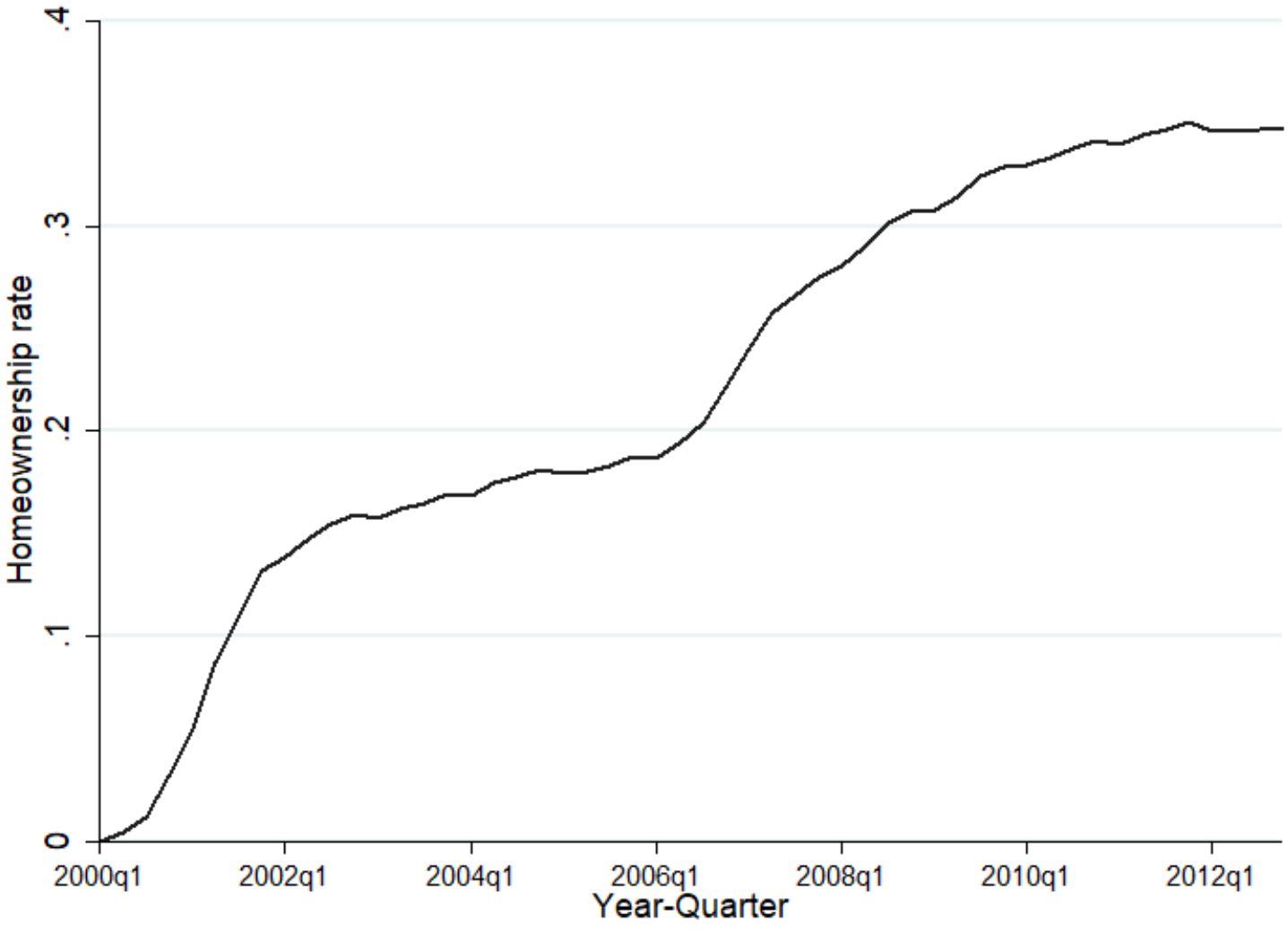


Table: Probability of Becoming a Homeowner as a Function of Discounts

Dependent Variable:	Bought during "This is My Home" Sale, 2005-2008					
	(1)	(2)	(3)	(4)	(5)	(6)
$Discount_t$	1.212***	0.681***	0.709***	–0.267	–0.245	–0.347
	(0.086)	(0.108)	(0.109)	(0.350)	(0.331)	(0.330)
$Discount_t^2$				2.704***	2.170***	2.440***
				(0.889)	(0.836)	(0.834)
$Discount_t^3$				–2.375***	–2.035***	–2.206***
				(0.636)	(0.597)	(0.597)
Tenure (Cts.)		0.043***			0.014***	
		(0.002)			(0.001)	
Disabled		–0.103*	–0.112**		–0.023	–0.024
		(0.055)	(0.055)		(0.016)	(0.016)
Married		0.234***	0.224***		0.064***	0.057***
		(0.049)	(0.049)		(0.014)	(0.014)
Num. Children		0.052***	0.062***		0.017***	0.020***
		(0.019)	(0.019)		(0.006)	(0.006)
HH age		0.005	0.002		0.001	–0.000
		(0.003)	(0.003)		(0.001)	(0.001)
Apt Characteristics		Yes	Yes		Yes	Yes
Tenure 5 Yr Group Dummies			Yes			Yes
Geo FE		Yes	Yes		Yes	Yes
Model	Probit	Probit	Probit	OLS-Poly	OLS-Poly	OLS-Poly
Num. Households	3,633	3,633	3,633	3,633	3,633	3,633

Strategy: Effects on New Homeowners' Labor Supply

LS effects for "This is My Home" buyers vs. never-buyers – four approaches: (Focus on 2005 event that increased discounts sharply.)

1. Raw averages of emp and labor income in each year
2. OLS diff-in-diffs, household fixed effects

$$y_{ht} = \gamma + \pi(I_t^{post} \times I_h^{buyer}) + X_{ht} + \theta_h + \delta_t + \varepsilon_{ht} \quad (1)$$

y_{ht} – employment or log labor income for household h in year t
X_{ht} – time-varying household characteristics
θ_h – household fixed effects
δ_t – year fixed effects

$$\left(y_{ht} = \gamma + \sum_{\tau \neq 2004} \pi_\tau (I_\tau \times I_h^{buyer}) + X_{ht} + \theta_h + \delta_t + \varepsilon_{ht} \right)$$

Strategy: Effects on New Homeowners' Labor Supply

3. IV using discounts
   (Can't use non-linear model in first stage (Angrist and Pischke (2009)))

$$I_t^{post} \times I_h^{buyer} = \gamma_1 + \pi_1 \left(I_t^{post} \times \widehat{I_h^{buyer}}^{step0} \right) + X_{1ht} + \theta_{1h} + \delta_{1t} + \varepsilon_{1ht}$$

   and the second-stage equation is:

$$y_{ht} = \gamma_2 + \pi_2 \left(\widehat{I_t^{post} \times I_h^{buyer}} \right) + X_{2ht} + \theta_{2h} + \delta_{2t} + \varepsilon_{2ht} \quad (2)$$

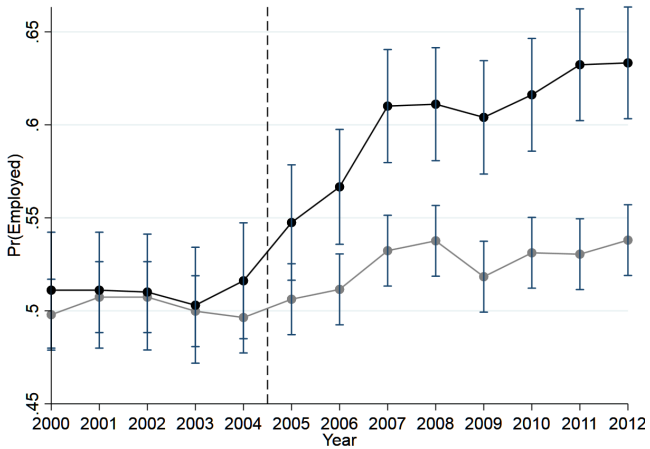
4. Nearest-neighbor matching (NNM):
   Buyers vs. never-buyers ex-ante similar on observables.
   Estimate (1) with matched set FE (Ichino et al (2017)).

Several Administrative Data Sources

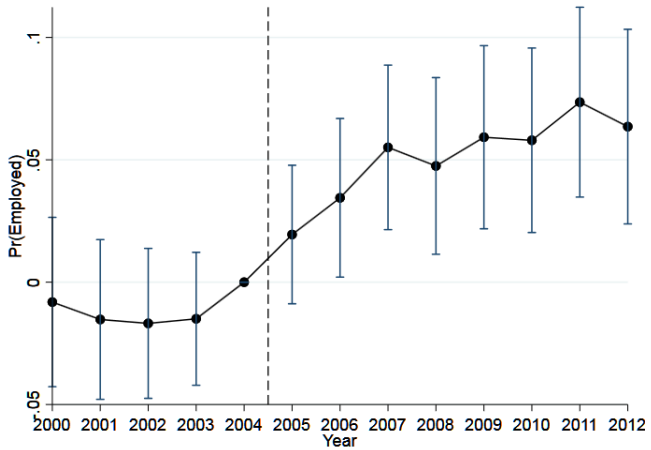
- Public housing records (Amidar and Amigur), 1960-2012
  - 90% of Israel's public housing units
  - Unit chars, tenants, rental rates and payments, sale details
  - Construct panel of units by detailed location, linked to tenants
- Ministry of Housing memos: sale discount rules; rent rules
- Social Security Data (NII), 2000-2012
  - Employment, labor income
  - Demographics (facilitate discount calculation)

Employment Probability Effects: Four Methods

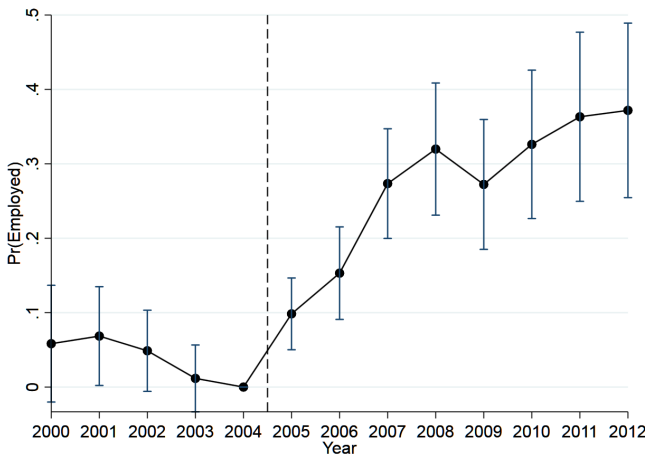
5-7% Increase



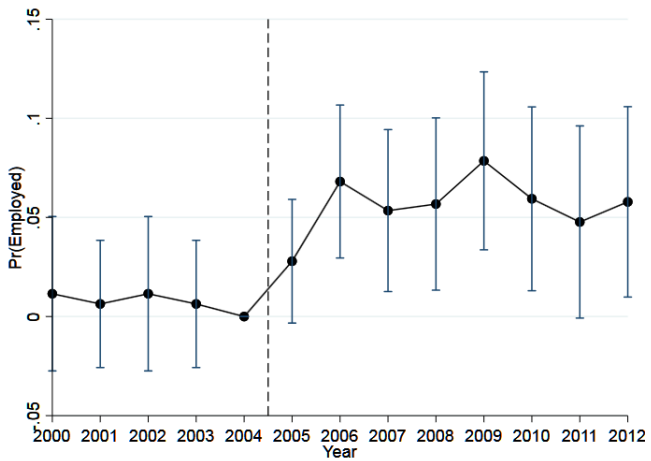
(a) Raw Data



(b) OLS FE



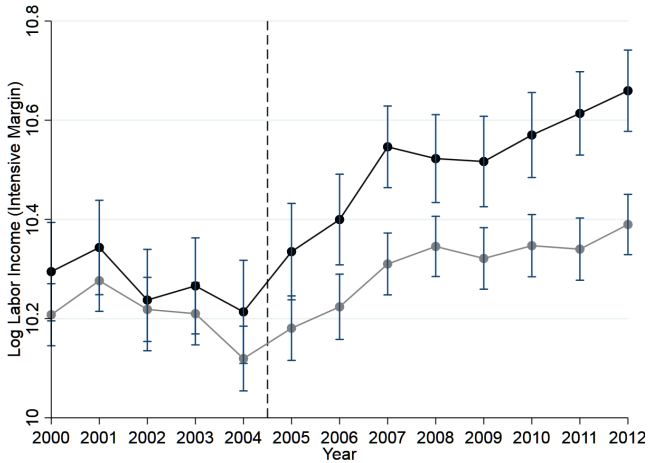
(c) IV



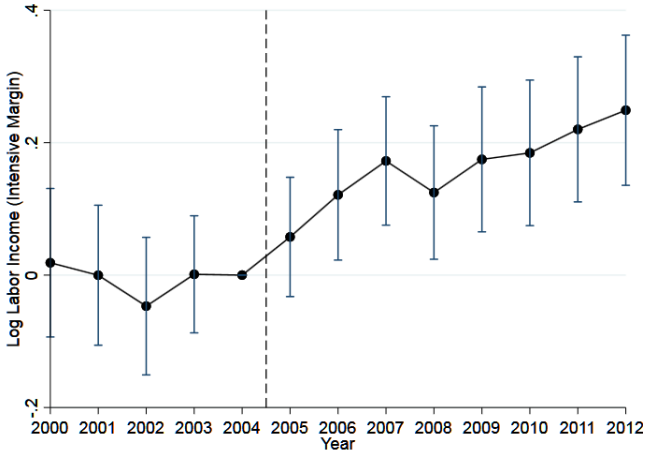
(d) NNM-1

Labor Income Effects (Intensive Margin): Four Methods

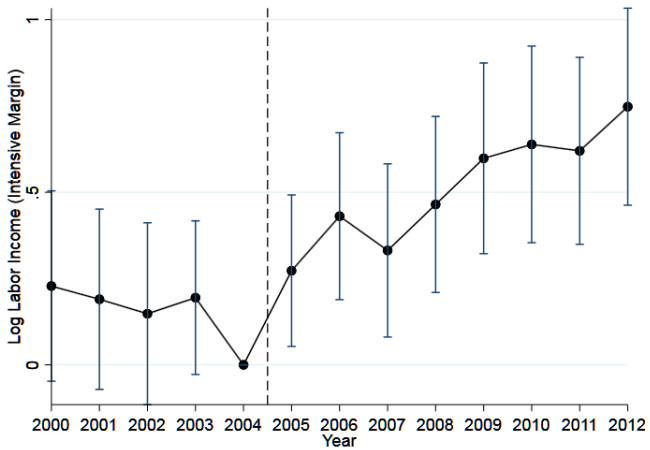
12-12.5% Increase



(a) Raw Data



(b) OLS FE



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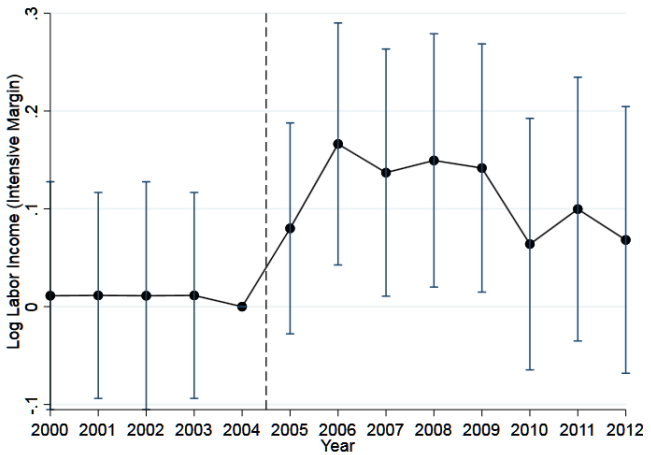


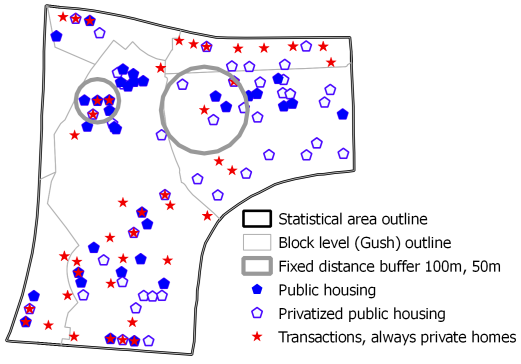
(d) NNM-1

Aggregating and Estimating Neighborhood Price Effects

- Aggregate these ownership changes to neighborhood level, measure effects on quality
- ID challenge: homeownership covaries with residents and housing stock
  - Across neighborhoods in x-section, within neighborhood over time
  - Neighborhood level: residents may anticipate price appreciation
  - Ideally want to assign ownership (or subsidy) randomly to renters
- Privatization changes ownership, holding constant the residents and housing stock
  - HR changes in clusters, treating nearby always-private units
  - Measure effects on private home values, isolating externalities

Example Public Housing Neighborhood in Be'er Sheva

(a) City View



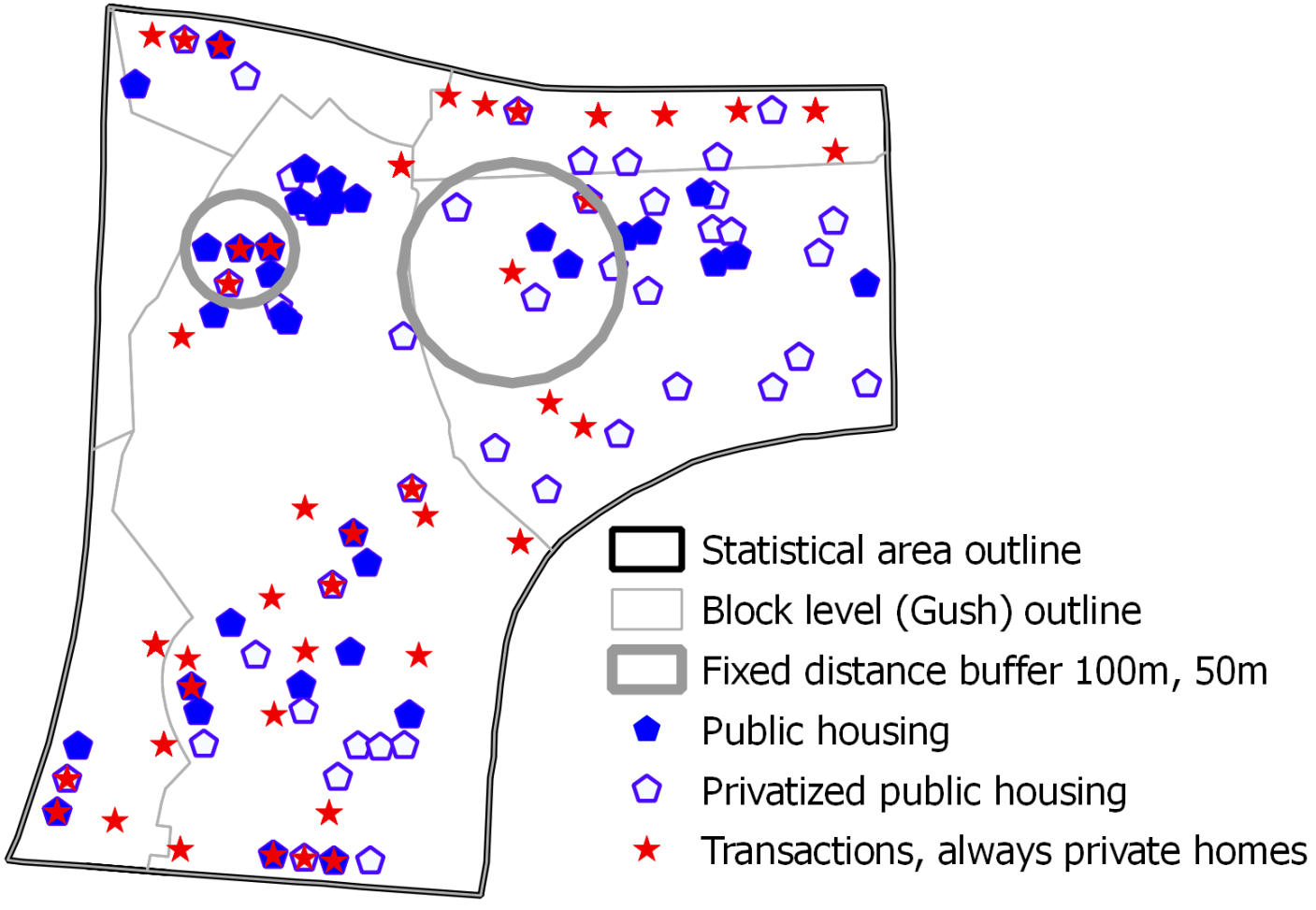
(b) Geographic Levels

(c) 2000

(d) 2012

Neighborhood-Level Natural Experiment

(Tax Data on Transactions)



Strategy: Neighborhood Price Effects

Several empirical approaches:

1. OLS, Neighborhood FE, predicting log price:

$$p_{int} = \alpha + \beta HR_{n,t-2} + \eta_n + s_{n,t-2} + Z_i + \delta_t + \varepsilon_{int} \tag{3}$$

   $HR_{n,t-2}$ is the *actual* public housing homeownership rate in neighborhood n in q $t-2$

   Expect $\beta > 0$ if homeownership has positive externalities

2. IV using discounts
   - Instrument works at HH level; HR measured at neighborhood level
   - Need predicted HR by q; HH purchases not indep. across periods
   - Estimate hazard of sale and aggregate

3. Wtihin-town diff-in-diffs: large vs. small HR change neighborhoods

Table: OLS and IV Price Estimates – Full Sample

Panel A: 100m Buffer Zone Centered on Each Private Transaction

Dependent Variable: $\ln(p)$	OLS (1)	OLS (2)	OLS (3)	OLS (4)	IV (5)	IV (6)	IV (7)	IV (8)
Homeownership Rate$_{t-2}$	0.161***	0.187***	0.218***	0.199***	0.147***	0.165***	0.179***	0.143***
	(0.025)	(0.015)	(0.027)	(0.036)	(0.024)	(0.016)	(0.029)	(0.040)
N	77,662	22,278	22,278	22,276	77,662	22,278	22,278	22,276
1st Stage KP F-Stat					5552	19292	7994	4360
Geo Control	Lat-Lon	Lat-Lon	Building	Apt	Lat-Lon	Lat-Lon	Building	Apt

Panel C: Block Level (Centroid Polynomial)

Dependent Variable: $\ln(p)$	OLS (1)	OLS (2)	OLS (3)	OLS (4)	IV (5)	IV (6)	IV (7)	IV (8)
Homeownership Rate$_{t-2}$	0.192***	0.464***	0.475***	0.444***	0.195***	0.351***	0.380***	0.329***
	(0.049)	(0.104)	(0.110)	(0.111)	(0.050)	(0.109)	(0.105)	(0.102)
N	120,054	32,829	32,829	32,817	120,054	32,829	32,829	32,817
1st Stage KP F-Stat					2265	46.64	79.42	65.23
Geo Control	Centroid	Block	Building	Apt	Centroid	Block	Building	Apt

Table: OLS and IV Price Estimates – Repeat Sales Comparison

Panel A: 100m Buffer Zone Centered on Each Private Transaction

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1st Stage KP F-Stat					2265	46.64	79.42	65.23
Geo Control	Centroid	Block	Building	Apt	Centroid	Block	Building	Apt

Within-Locality Diff-in-Diffs Estimates of Price Effects, "This is My Home" Sale Event

(Implied 5.5% price increase per 10pp HR increase)

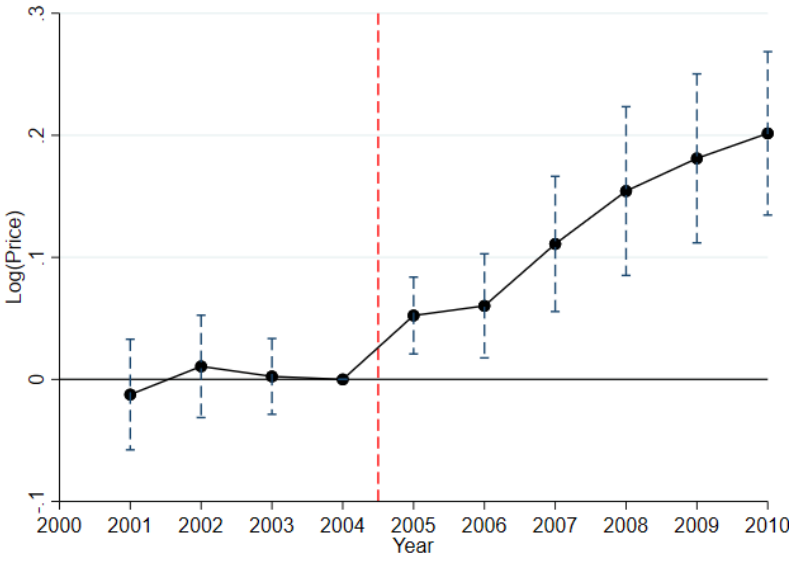


Figure: (a) OLS

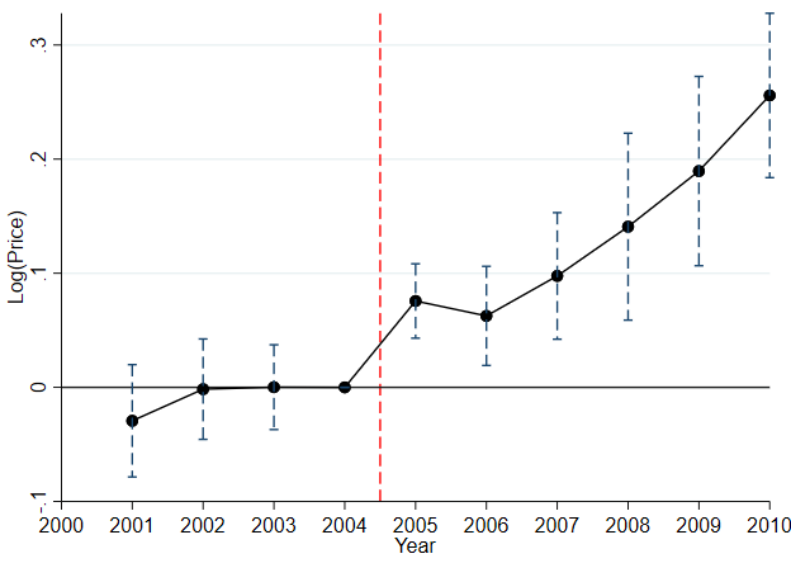


Figure: (b) IV

Magnitudes

- Our best estimate: 1.5-2% price increase per 10pp HR increase
  - Economically meaningful relative to other neighborhood amenities:
    - School quality: 2% per 5% test score increase (Black 1999)
    - Foreclosures: –1.5-6% very close vs. close (Campbell et al. 2011)
    - Rent decontrol: 16% over ten years (Autor et al. 2014)
  - U.S. homeownership rates mostly 55-85% by geo area
- Coulson and Li (2013): 4.5% price increase per 10pp HR increase
- Eliminating endogeneity in homeownership rate changes reduces externality estimate by 1/2 to 2/3!

Summary of Mechanisms Examined

- Labor supply, improved environment, working role models
  - (Exit from means testing? 1,000 NIS ↑income → 2.5 NIS ↑rent)
- Attractiveness of neighborhood to young families with kids
  - Young population share (age 0-17) (positive)
  - School quality/ test scores (positive)
- Civic engagement and voter turnout (positive)
- Geographic stability: nah - pub housing renters highly stable (4% of renters move after 5 yrs vs. 8% of buyers)
- Renovations and home care
  - Buyers renovate more, but mostly modestly and indoors
  - Effect unlikely to stem from wealth-driven upgrades

Young Population Share

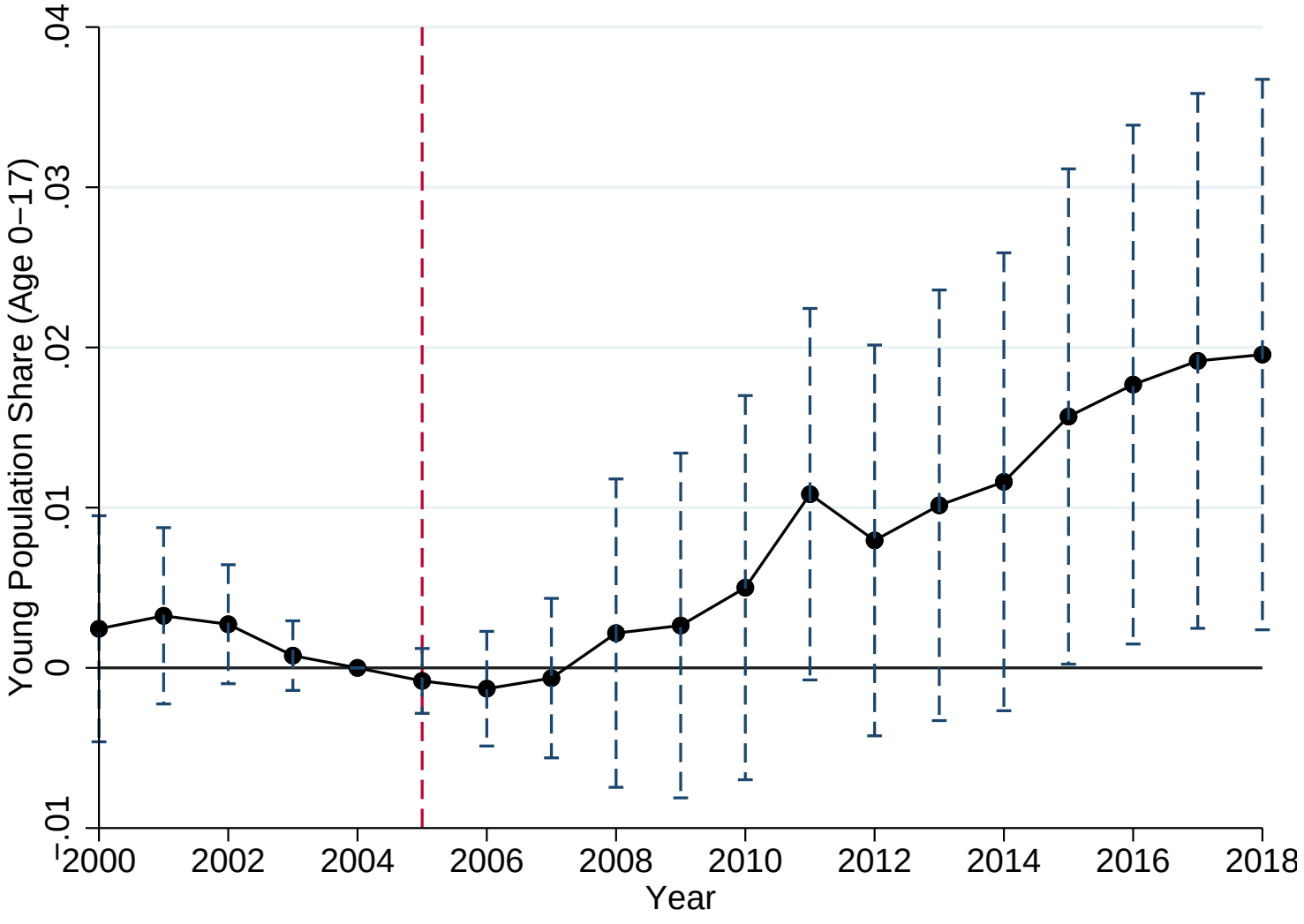
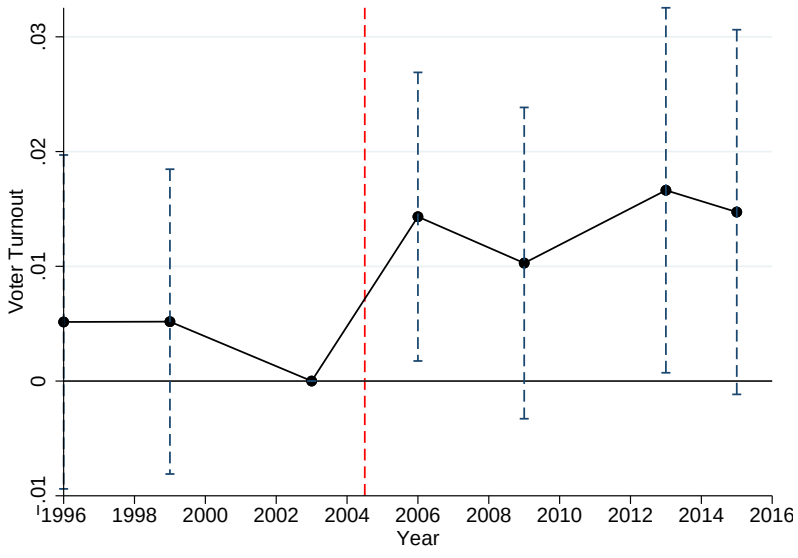


Table: OLS and IV Price Estimates of Voter Turnout and School Quality

Dependent Variable:	Voter Turnout		School Quality	
	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)
Homeownership Rate	0.045**	0.054**	0.217**	0.248**
	(0.021)	(0.023)	(0.099)	(0.109)
N	2,252	2,252	1,570	1,570
N Clusters	418	418	468	468
1st Stage KP F-Stat		702.30		639.30

Within-Town Diff-in-Diff: Voter Turnout



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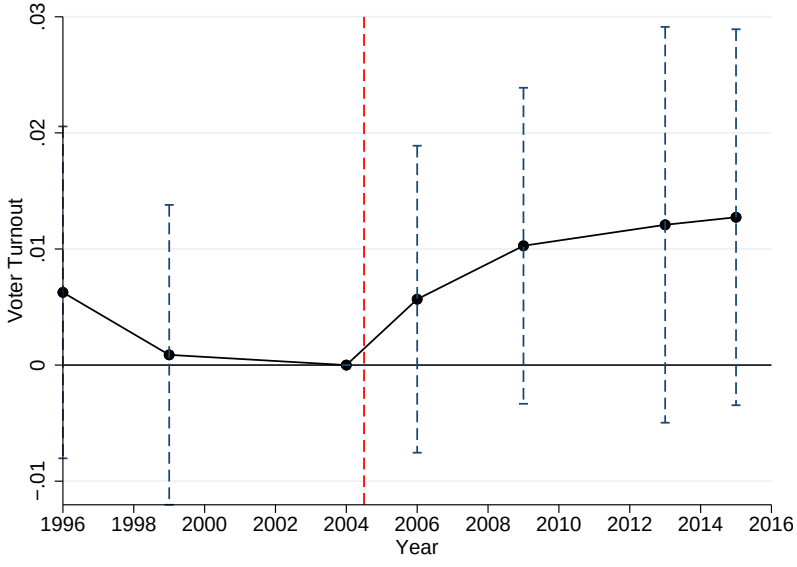

Figure: (b) IV

Robustness

- Robust to alternative neighborhood definitions, geographic controls
- Exogeneity of discounts
  - Instrumented HR changes not corr. w/always-private HR changes
  - Instrumented HR changes not corr. w/emp. center access
- Assessed sensitivity to parallel trends assumption
- Robust to shorter estimation window (large price appr. since 2008)
- Robust to exclusion of major cities, TLV and JLM
- Robust to alternative lag structures

Discussion

- First paper to use natural expt to estimate neighborhood quality effects
  - Previous neighborhood price effects likely biased, 2-3x larger
  - Labor supply one possible mechanism, shift to working class

    (Field 2007; Sodini et al. 2016; Bergman et al. 2019)
- Results are highly policy relevant
  - Governments spend billions encouraging homeownershp
  - Low income households are the likely marginal owners:
    78% homeownership above median income, 50% below (U.S. Census)
  - Hopeful findings for savings plan, mortgage assistance policies
  - Privatizations of public housing stocks can create value
    (gain from price appreciation more than 12x discount cost)
- Possible long-run, dynamic effects of homeownership on children
  - Importance of neighborhoods for children's outcomes

    (Chetty et al. 2016; Chetty and Hendren 2018; Chyn2018)
  - Homeownership may improve children's enviornments: more nearby working adults, higher overall neighborhood quality