

# Real-Estate Investors, House Prices and Rents: Evidence from Capital-Gains Tax Changes

Itai Ater<sup>1</sup>, Yael Elster<sup>2</sup> and Eran B. Hoffmann<sup>3</sup>

<sup>1</sup>Tel Aviv University & CEPR

<sup>2</sup>University of Haifa

<sup>3</sup>The Hebrew University of Jerusalem

NBER Summer Institute – Real Estate  
July 2022

# Motivation

- Real-estate investors:= households who own 2 or more housing units
  - own large share of the housing stock
  - primary suppliers of rental housing
- Increased investors' activity in recent years (e.g., Australia, Canada, UK, US, *Israel*)
- Contributed to the 2000s housing boom in the US
- Policy debate: use taxes to push investors out of the housing market?
  - reduce demand for housing, lower house prices help first-time buyers
  - reduce supply of rental housing and raise rents, may hurt renters
- How investors affect housing markets, house prices and rents?

## Theoretical perspective – investor ownership and prices

- Without frictions & heterogeneity: house prices and rents not affected by investors
  - investor sells unit  $\Rightarrow$  owned-housing supply  $\uparrow$ , rental-housing supply  $\downarrow$
  - renter buys unit  $\Rightarrow$  owned-housing demand  $\uparrow$ , rental-housing demand  $\downarrow$
  - $\Rightarrow$  offsetting effects, prices determined by user cost & demand for housing services
- With frictions & heterogeneity: downward sloping demand for rental & owned housing
  - this paper: [how steep is demand?](#)

## This paper

- Setting: Israeli housing market, data on stock, transactions, & rents, 2009-2014
- Capital-gains tax changes affecting sales by a subset of investors

# This paper

- Setting: Israeli housing market, [data on stock, transactions, & rents](#), 2009-2014
- Capital-gains tax changes affecting sales by a [subset of investors](#)

## ① How do tax changes impact investors' sales?

- identification: discontinuity around tax notch + diff-in-diff, control group = other investors
- temp. exemption from tax increased investor sales rate by 50%
- additional sales mostly of units they do not live in to non-investors

# This paper

- Setting: Israeli housing market, [data on stock, transactions, & rents](#), 2009-2014
- Capital-gains tax changes affecting sales by a [subset of investors](#)

## 1 How do tax changes impact investors' sales?

- identification: discontinuity around tax notch + diff-in-diff, control group = other investors
- temp. exemption from tax increased investor sales rate by 50%
- additional sales mostly of units they do not live in to non-investors

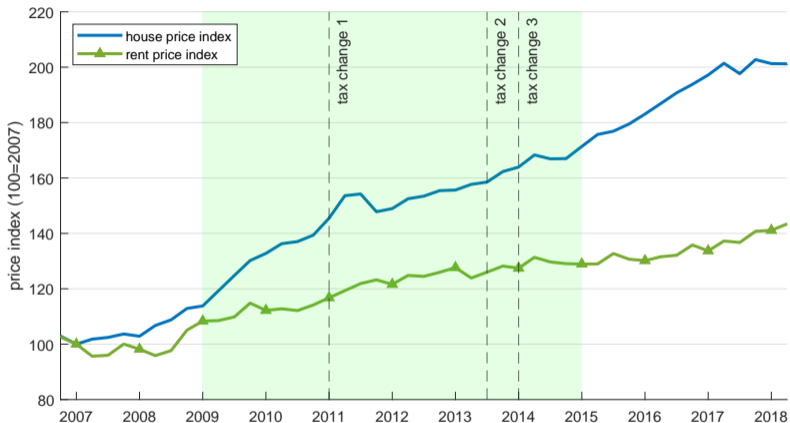
## 2 How do additional investors' sales impact local house prices & rents?

- identification: variation in investor composition across 360 local housing markets
- 1pp increase in sales out of stock (in half-year)  $\Rightarrow$  house prices 14%  $\downarrow$ , rents 10%  $\uparrow$

# Literature

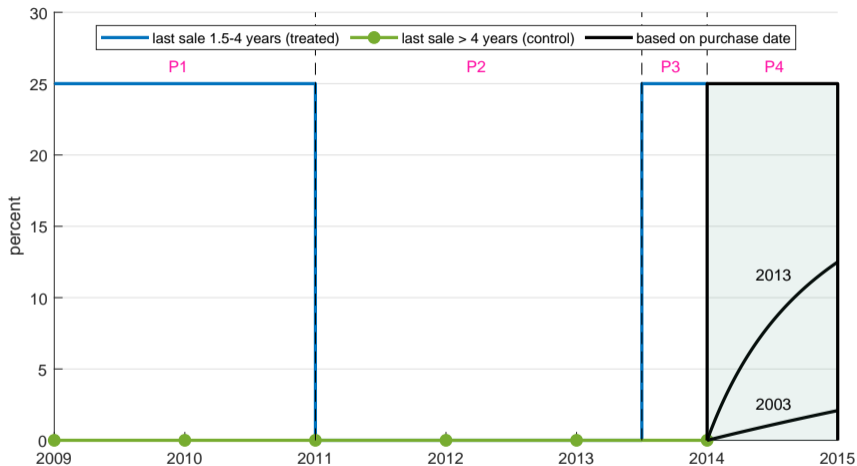
- **Housing transfer taxes affect transactions** Shan 11', Besley, Meads, & Surico 14', Kopczuk & Munroe 15', Slemrod, Weber, & Shan 17', Best & Kleven 18', Somerville, Wang, & Yang 20', Agarwal et al. 20', Han, Ngai & Sheedy 22'
  - here: capital-gains tax  $\downarrow \Rightarrow$  sales by investors, est. demand slopes
- **Real-estate investors affect prices** Haughwout, Lee, Tracy, van der Klaauw 11', Chinco & Mayer 16', Albanesi, De Giorgi, & Nosal 17', Gao, Sockin, & Xiong 20', Bayer et al. 20', Bayer, Mangum & Roberts 21', Defusco, Nathanson & Zwick *forthcoming*
  - here: rise in investor sales  $\Rightarrow$  house prices  $\downarrow$  and rents  $\uparrow$ , highlight policy tradeoff

# The Israeli housing market, 2007-2018



- Real house prices up 100%, rents up 40%

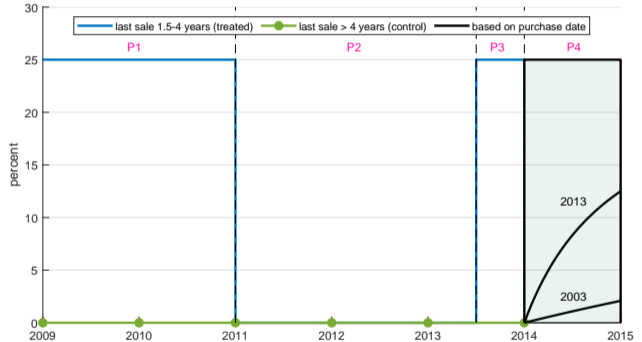
# Capital-gains tax on investors



more

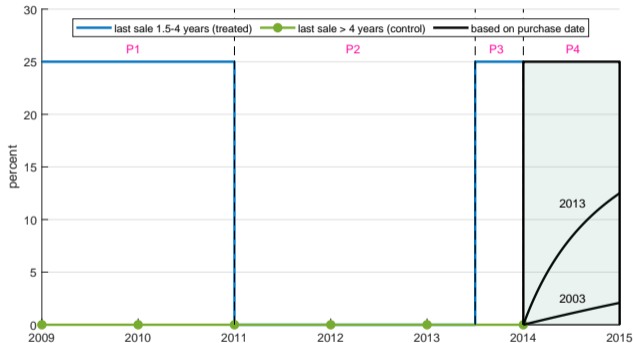
# 4 features of tax changes help identification

- 1 Exemption applies only to subset of investors



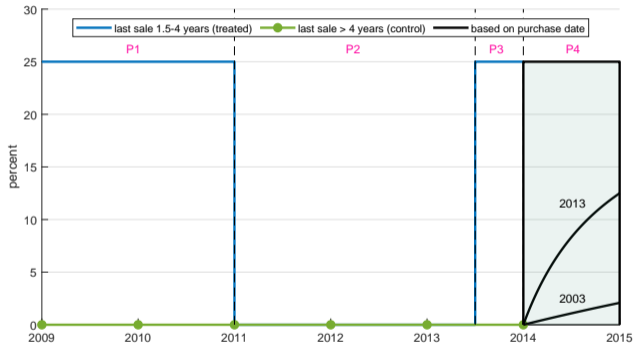
## 4 features of tax changes help identification

- 1 Exemption applies only to subset of investors
- 2 **Assignment based on sale of other housing units**



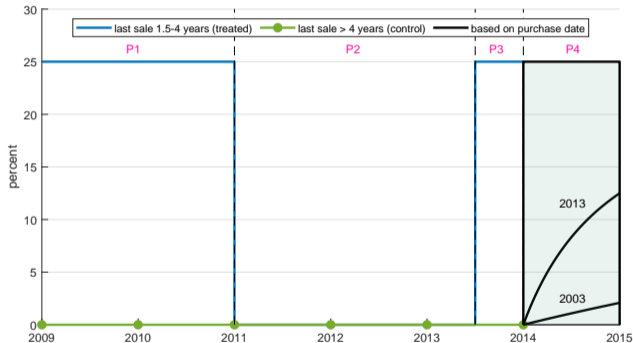
## 4 features of tax changes help identification

- 1 Exemption applies only to subset of investors
- 2 Assignment based on sale of other housing units
- 3 **Tax changed several times, difficult to anticipate**



## 4 features of tax changes help identification

- 1 Exemption applies only to subset of investors
- 2 Assignment based on sale of other housing units
- 3 Tax changed several times, difficult to anticipate
- 4 **Large changes: 25% ↔ 0%**



# Data

- **Housing stock** from property tax, 76 cities (89% of Israel's stock)
  - identity of owner & tenant, investor composition
- **All housing transactions** from Israel Tax Authority
  - identity of seller & buyer, construct hh ownership history, transaction prices & unit char.
- Additional sources:
  - **population registry**: construct households, identify investors' primary unit of residence
  - **rent survey** (used for constructing CPI)

## Characteristics of units sold by investors

	unit type		sales history	
	primary unit (1)	non-primary unit (2)	treated investors (3)	control investors (4)
<i>mean char.</i>				
rooms	3.7	3.3	3.4	3.4
area ( $m^2$ )	84.1	71.8	75.1	75.7
building age	30.1	40.3	39.6	36.8
price (mil. ILS)	1.18	0.91	1.01	0.99
<i>N</i>	31,496	69,195	11,626	89,412

Notes. Treated: investors who sold in last 1.5-4 years. Control: all other investors.

- Investors' primary units sold larger, newer than non-primary (similar to single-unit owners)

## Characteristics of units sold by investors

	unit type		sales history	
	primary unit (1)	non-primary unit (2)	treated investors (3)	control investors (4)
<i>mean char.</i>				
rooms	3.7	3.3	3.4	3.4
area ( $m^2$ )	84.1	71.8	75.1	75.7
building age	30.1	40.3	39.6	36.8
price (mil. ILS)	1.18	0.91	1.01	0.99
<i>N</i>	31,496	69,195	11,626	89,412

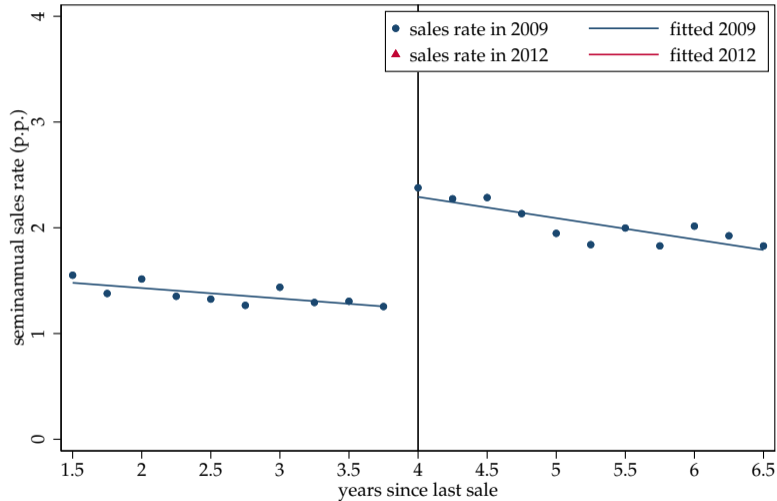
Notes. Treated: investors who sold in last 1.5-4 years. Control: all other investors.

- Investors' primary units sold larger, newer than non-primary (similar to single-unit owners)
- Treated & control sell similar units

## Tax changes & investors' sales

- Sort investors by time since last sale: discontinuity in sales rates
- Estimate diff-in-diff: treated vs. control investors
- Decompose sales into primary/non-primary & buyer type

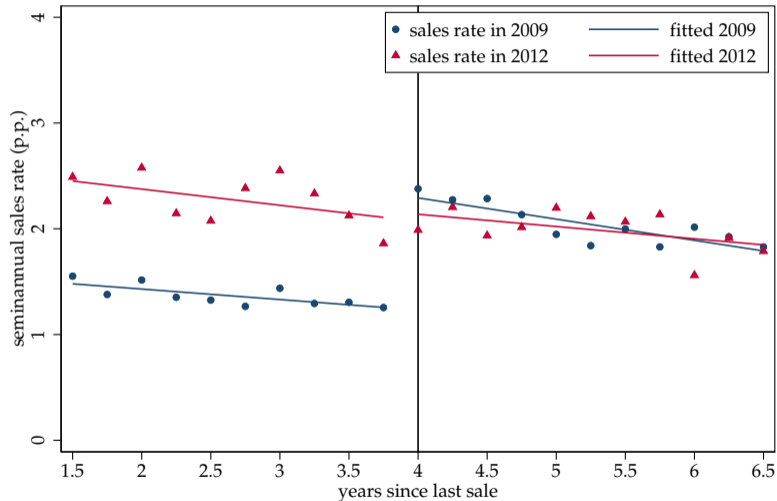
# Discontinuity of investors' sales rates: before & after



- Pre-exemption discontinuity (P1), eliminated by temp. exemption (P2)

semi-annual

# Discontinuity of investors' sales rates: before & after

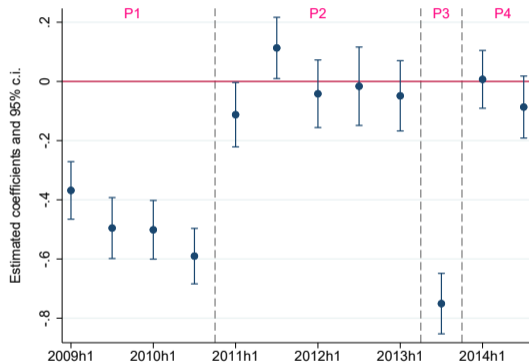


- Pre-exemption discontinuity (P1), eliminated by temp. exemption (P2)

semi-annual

## Tax exemption increases sales rates by 50%

- Diff-in-diff equation:  $\text{sales rate}_{sjt} = \beta_t \text{treated investors}_s + \delta_j + \theta_t + \varepsilon_{sjt}$



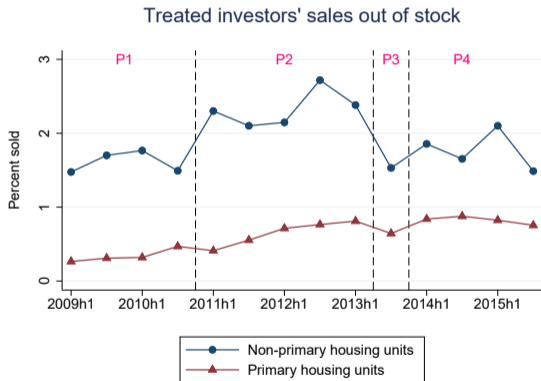
Notes. Treated: investors who sold in last 1.5-4 years. Control: all other investors.

- Tax exemption increases semiannual sales rate by 0.6pp (from 1.2 to 1.8 percent)

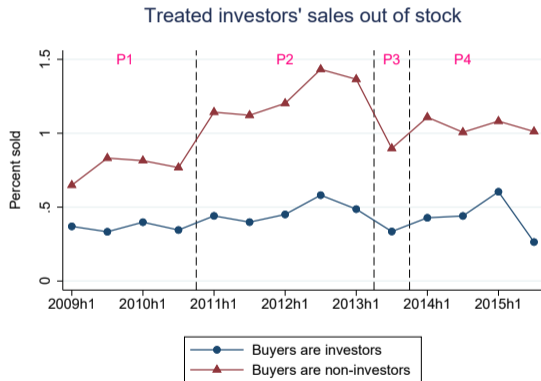
Levels

# Decomposition of investor sales

Most additional sales are **non-primary** units



Most additional sales are to **non-investor** buyers



- Suggests rental units taken off the market

# How investors' sales affect local house prices & rents?

- Generally, difficult to estimate effect of quantities on prices
  - sales volume, prices, rents are jointly determined by local demand & supply factors
- Our strategy: **construct supply shifters using local investor ownership composition**
- Identification conditions:
  - capital-gains tax changes are independent of local demand shocks, or
  - composition of investors in local markets is uncorrelated with pre-trends

Test of pre-trend

## Estimation with composition of investor ownership

- 1 Predict  $\widehat{\text{sales rate}}_{s jt}$ , investor type  $s \in \{\text{treated, control}\}$ , local market (j), half-year (t) using diff-in-diff estimates
- 2 Construct predicted investors' sales out of housing stock using local ownership shares,  $\text{share of units}_{s jt}$ , as weights

$$\widehat{\text{investors' sales}}_{jt} = 100 \times \sum_s \widehat{\text{sales rate}}_{s jt} \times \text{share of units}_{s jt}$$

- 3 Regress  $\text{transaction prices}$  or  $\text{survey rents}$  of unit  $i$  on predicted  $\widehat{\text{investors' sales}}$

$$\log y_{ijt} = \beta \widehat{\text{investors' sales}}_{jt} + \gamma X_i + \delta_j + \theta_t + \varepsilon_{ijt}$$

- $X_i :=$  housing unit char.  $\delta_j :=$  local market FEs,  $\theta_t :=$  half-year FEs

## Effect of sales by investors on house prices

*Dependent variable: log transaction price*

Sample:	all units (1)	≤ 3 rooms (2)	> 3 rooms (3)	new units (4)	resale units (5)
Investors' sales (pp)	-0.14* (0.08)	-0.24*** (0.08)	-0.14 (0.09)	-0.05 (0.09)	-0.13* (0.08)
$R^2$	0.75	0.72	0.69	0.75	0.74
Observations	399,081	179,974	219,107	80,258	318,823

*Notes.* All regressions control for unit characteristics, half year FEs & local market FEs. Standard errors are clustered by local market. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

- 1pp ↑ in sales out of stock ⇒ 14% ↓ in prices
- Stronger effect on prices of small units, resale prices

## Effect of sales by investors on rents

*Dependent variable: log rent*

Sample:	all units	new leases	new leases $\leq 3$ rooms	new leases $> 3$ rooms	extended leases
	(1)	(2)	(3)	(4)	(5)
Investors' sales (pp)	0.01 (0.04)	0.10* (0.06)	0.14** (0.07)	-0.03 (0.12)	-0.03 (0.05)
$R^2$	0.75	0.77	0.74	0.75	0.74
Observations	64,817	19,436	11,872	7,564	45,381

Notes. All regressions control for unit char., half year FEs & local market FEs. Standard errors are clustered by local market. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

- 1pp  $\uparrow$  in sales out of stock  $\Rightarrow$  10%  $\uparrow$  in rent of new leases

## Lock-in effect and house prices & rents

- Counterfactual exercise: eliminate all exemptions from capital-gains tax on investors
  - 0%→25% tax rate on pre-2011 exempted investors (30% of housing stock)
- Lock-in effect on investors' sales out of housing stock:

$$\underbrace{\text{share of units affected by policy}}_{30\%} \times \underbrace{\Delta \text{sales rate}}_{=-0.6pp} = -0.18pp \text{ investors' sales}$$

- Lock in effect on house prices, rents:

$$\underbrace{\text{lock-in effect on sales}}_{=-0.18} \times \underbrace{\text{demand slope}}_{=-14\%} = +2.5\% \text{ house prices}$$

$$\underbrace{\text{lock-in effect on sales}}_{=-0.18} \times \underbrace{\text{demand slope}}_{=10\%} = -1.8\% \text{ rents on new leases}$$

## Conclusion

Q: How do investors respond to capital-gains tax changes?

A: 25%→0% capital-gains tax leads to 0.6pp (50%) ↑ sales, change in ownership structure

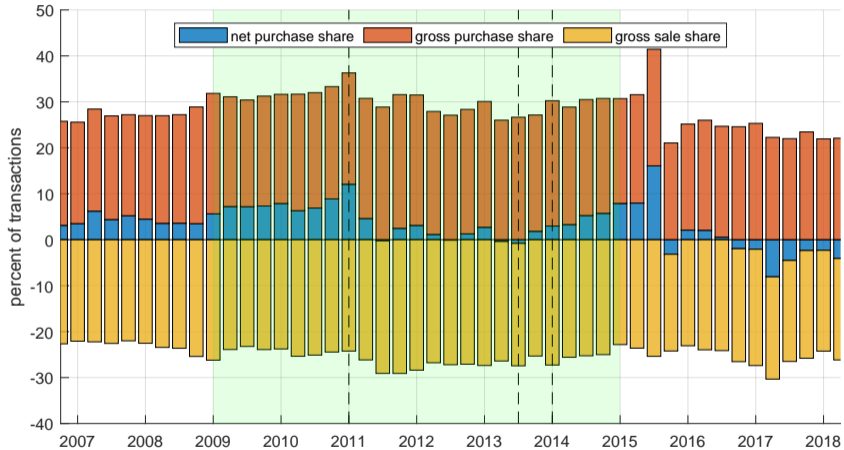
Q: What is the effect of investor sales on local house prices, rents?

A: 1pp ↑ in sales rate by investors lead to 14% ↓ house prices, 10% ↑ rents on new leases

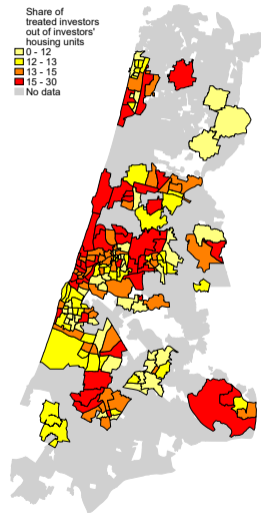
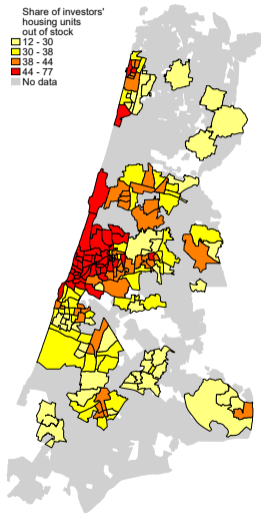
- Tax policy: can reduce prices, increase homeownership rate
- ...but at the cost of higher rents, may hurt renters

# Appendix figures and tables

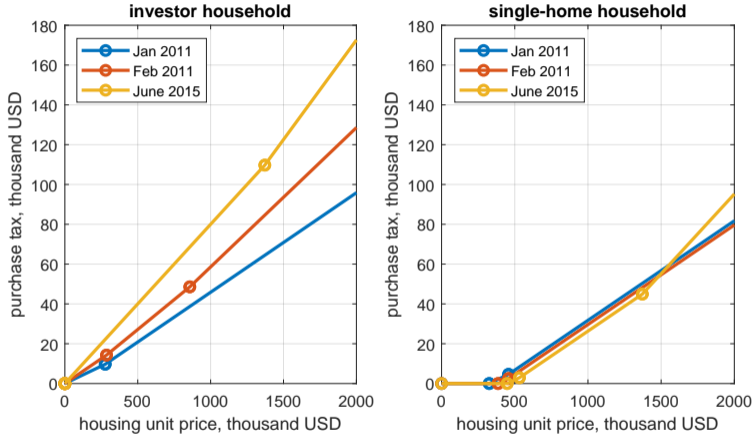
# Net purchase share by investors



# Investor ownership composition by local market (Central Dist., 2010)

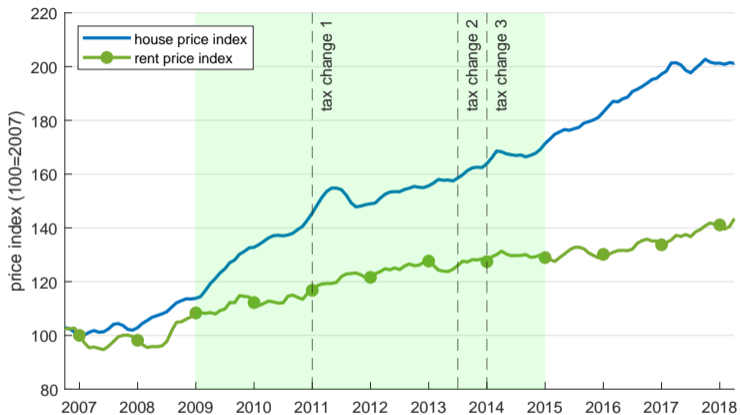


# RE tax reforms in Israel: Purchase tax

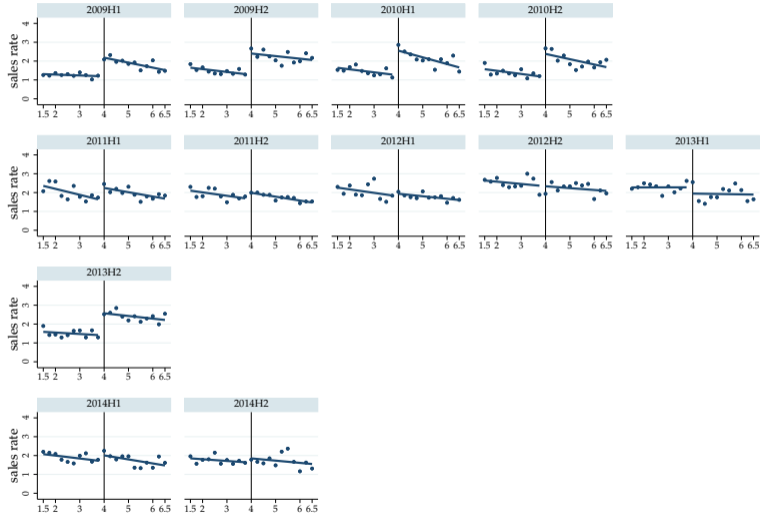


[Back](#)

## House prices & rents, policy action



# Discontinuity each half-year period

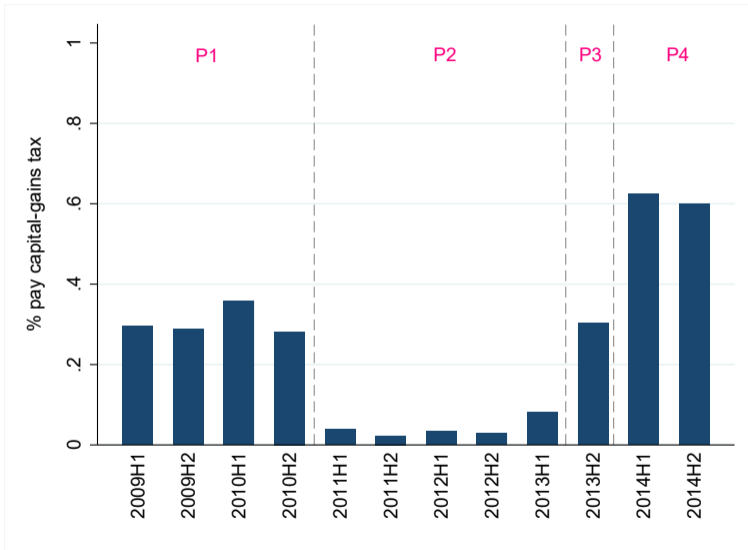


[Back](#)

## Direct evidence on tax payment

- Investors could avoid taxes by waiting, use other exemptions
- Some investments yield negative cap-gains, no tax liability
- Do treated investors pay capital-gains taxes?
- Capital-gains tax records indicate whether taxes are paid on each transaction

# Treated investors paid almost no taxes during exemption period



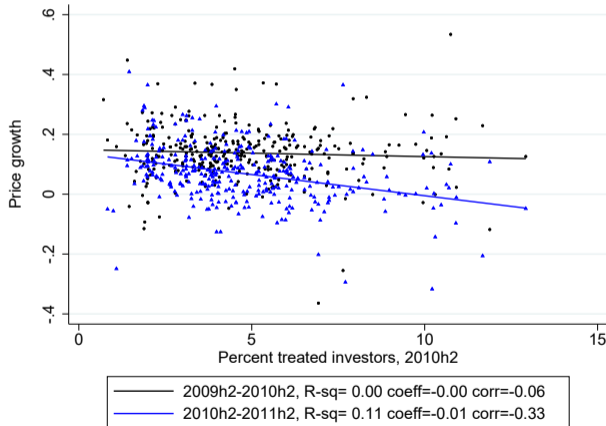
## Where do non-investor buyers come from?

- Official residence of non-investor buyers in 1 year pre & 3 years post trade
- 13% already rented in the same location
- 60% moved in from another location
- 27% don't move in (noisy measurement)

⇒ Investors' sales change the allocation of rental housing

## Identification concern: pre-treatment trends

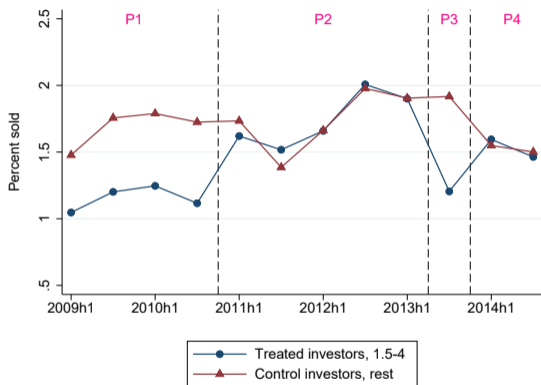
- Policy may be designed in response to price appreciation in treated areas
- We find no pre-trend correlation between price appreciation, share of treated investors



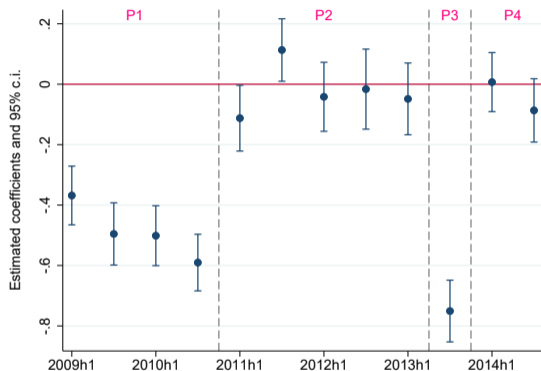
[Back](#)

# Tax exemption increases sales by 50%

Panel A: Sales rate



Panel B: Coefficient in controlled regression



- Tax exemption period (P2): semiannual sales from 1.2% to 1.8%

Back