# Is the housing market an inequality generator?

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# The concept and definition of an inequality generator

- Jensen and Hansen borrow 2 and 4 mill and purchase houses at 10 and 5 mill
- Houses appreciate to 12 mill and 6 mill
- Equity: 8 to 10 (2 mill, 25 percent), 1 to 2 (1 mill, 100 percent)
- Is this indicative of inequality acceleration or deceleration?
- This article focuses attention on differences in capital gains, not size of returns

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# What our article does

- It studies capital gains in the Norwegian housing market
- It follows 77,554 owners from 1 Jan 2007 to 1 Jan 2019
- Panel of all individuals in 6 cohorts 1965-1990 who owned at start and in the end
- We use as dispersion metric P90 less P10, not Gini nor P90/P10
- The reason: We focus attention on purchasing power

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# What our article discovers

- Key finding: Large increases in our dispersion metric P90-P10
- House price changes Granger cause capital gains dispersion
- Large differences in dispersion development across cohorts and geography
- Small differences between males and females
- Dispersion development associated with income development across municipalities

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# Why do we care?

- Macro: Housing is the business cycle (Leamer (2007, 2015)
- Micro: Houses are the saving vehicles for most households
- Inequality is an important issue for society and contemporary debate
- Capital gains in the housing market key component of inequality
- High granularity data may inform the debate

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# Novelty and contribution

- Many studies of inequality of wealth, income, and consumption
- Fewer studies of dispersion of capital gains over time
- We follow panel of 77,554 owners in 6 cohorts over 12 years (2007-2019)
- We limit the influence of selection biases
- The AVM yields accurate estimates
- The AVM allows high temporal granularity (quarters)
- We employ transaction prices

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# Selected related literature

- Fagereng et al. (2020) Econometrica: Returns to wealth
- Aaberge et al. (2021) Statistics Norway: Income, wealth inquality and taxes (retained earnings, value of housing services, returns to assets) 2001-2018
- Benhabib and Bisin (2018) JEL: Wealth
- Benhabib et al. (2017) AER: Earnings inequality
- Blundell and Etheridge (2010) Rev. Ec. Dynamics: Consumption, income, earnings
- Attanasio and Pistaferri (2016) JEP: Consumption inequality

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# Substantiation and documentation

- Individual owners (single unit owners and multiple unit owners)
- No firms
- Panel consists of 77,554 owners who owned at least one housing unit on 1 January 2007 and on 1 January 2019
- 3 kinds of capital gains
  - Realized (2 transaction prices)
  - Semi-realized (1 AVM estimate, 1 transaction price)
  - Potential (2 AVM estimates)

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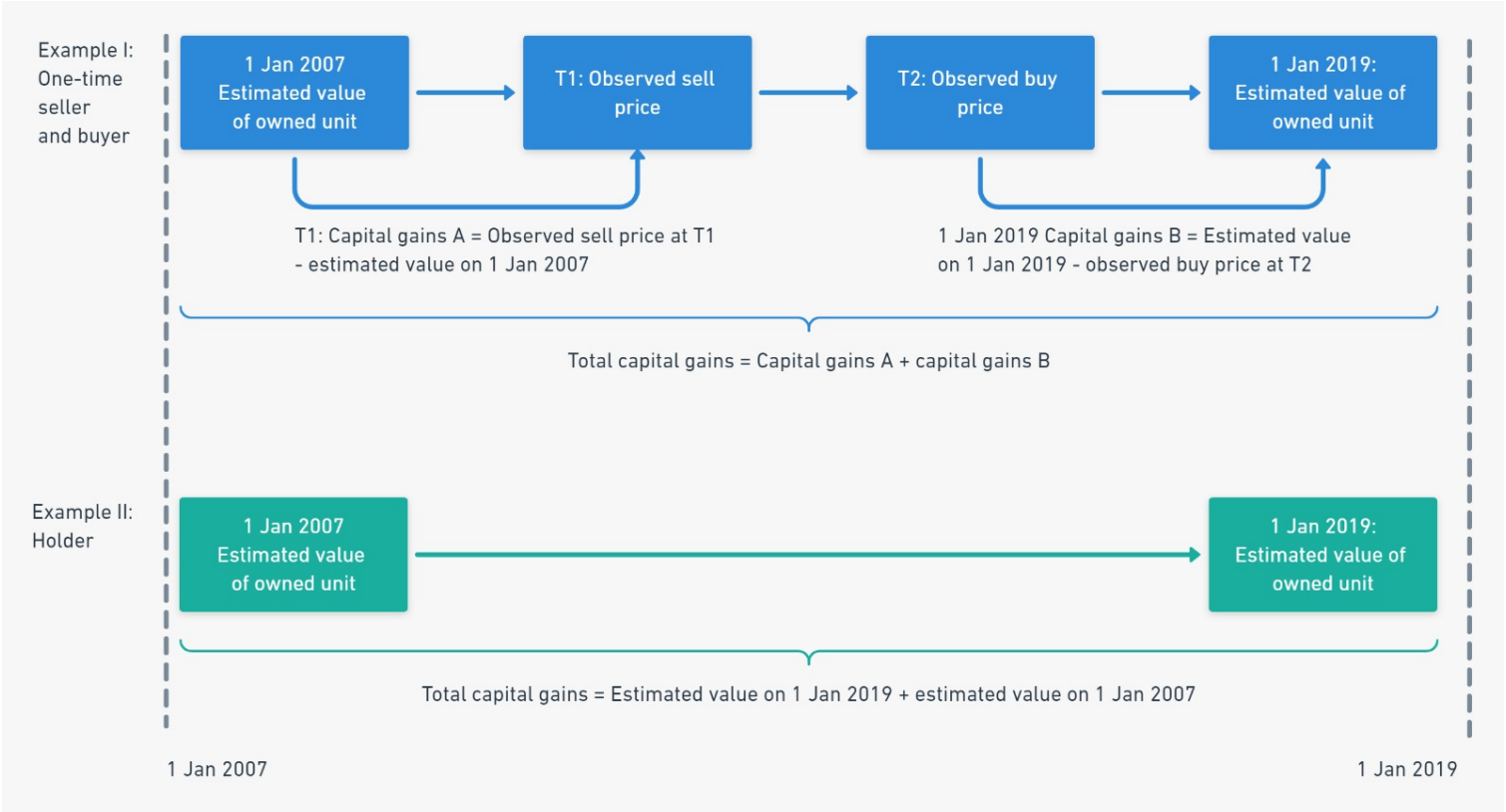
# The idea of following capital gains for a fixed panel



# Data

| Type | Unit (N) | Gini | P10 | Median | Mean | P90 |
|---|---|---|---|---|---|---|
| House values Jan 1 07 | House (75,592) | 0.263 | 1,109,981 | 1,964,056 | 2,230,537 | 3,628,694 |
| House values Jan 1 19 | House (77,591) | 0.289 | 1,908,621 | 3,536,648 | 4,117,303 | 6,866,956 |
| Owner values Jan 1 07 | Owner (77,554) | 0.291 | 695,642 | 1,276,776 | 1,487,019 | 2,468,700 |
| Owner values Jan 1 19 | Owner (77,554) | 0.310 | 1,208,114 | 2,249,533 | 2,710,598 | 4,641,895 |
| Capital gains Jan 1 19 | Owner (77,554) | | 421,334 | 873,137 | 1,094,006 | 1,986,294 |
| | | | Birth year cohort | | | |
| | 1965 | 1970 | 1975 | 1980 | 1985 | 1990 |
| No. of owners | 26,697 | 24,948 | 16,793 | 7,638 | 1,406 | 72 |

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# Dispersion metric

- Gini coefficient and negative capital gains: Lorenz curves not defined, but techniques to compute Gini
- The ratio P90/P10 masks the difference in purchasing power between 2 mill/1 mill and 20 mill/10 mill
- The difference P90-P10 highlights the difference in purchasing power
- We show that the P90-P10 on capital gains differs from Gini on owned values

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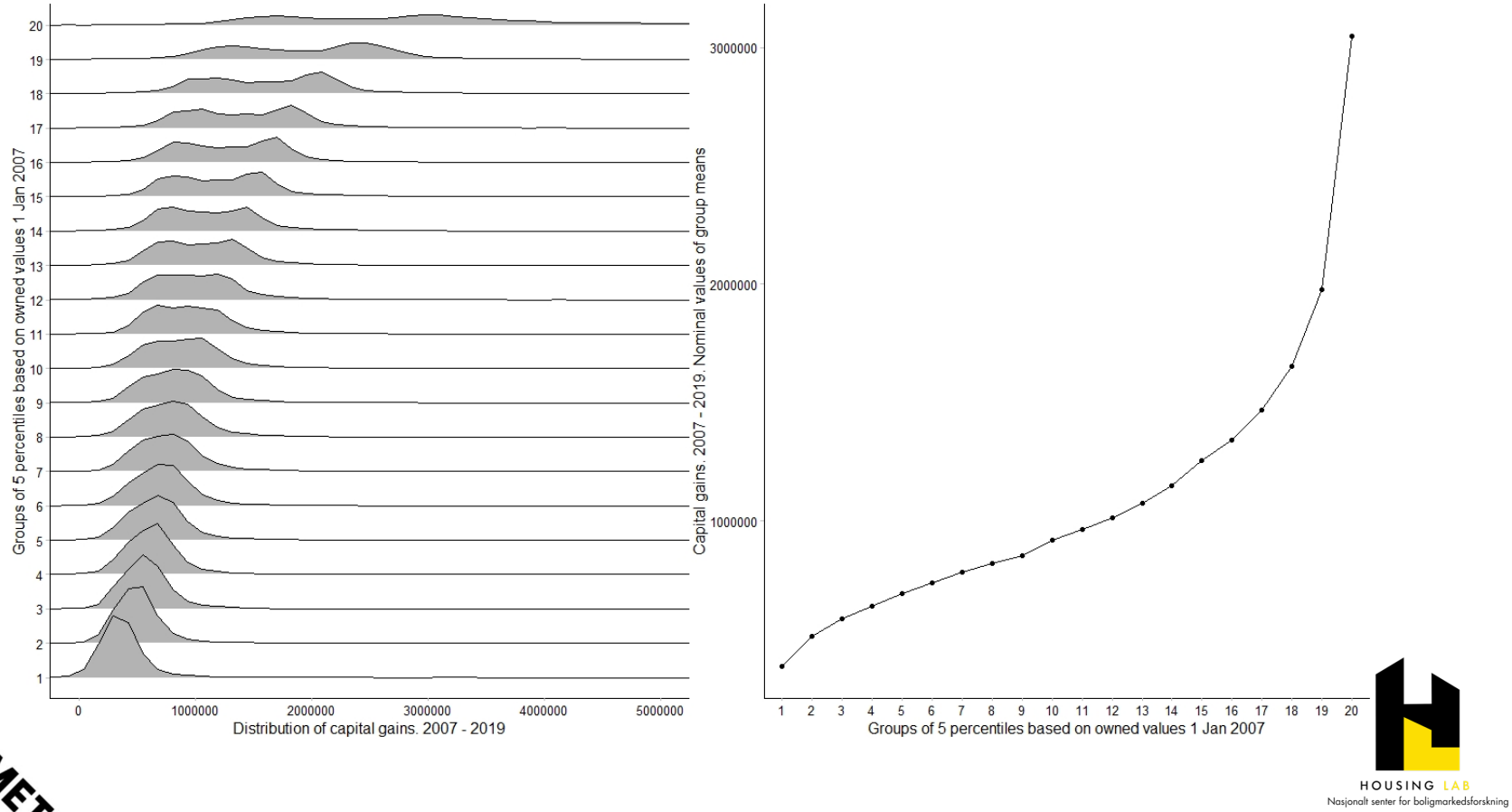
# Main finding: 20 groups of 2007-owned values vs gains 2007-2019

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# Selected motivating results

- Oslo owners: P90 of capital gains 2007-2019: NOK 3.35 million
- 80 times larger than the average monthly wage before tax
- Non-Oslo, P90: NOK 1.67 million
- Capital gains group 20 (3,048,110): 54 percent larger than group 19 (1,978,560)
- Group 19: 115 percent larger capital gains than group 10 (NOK 918,885)

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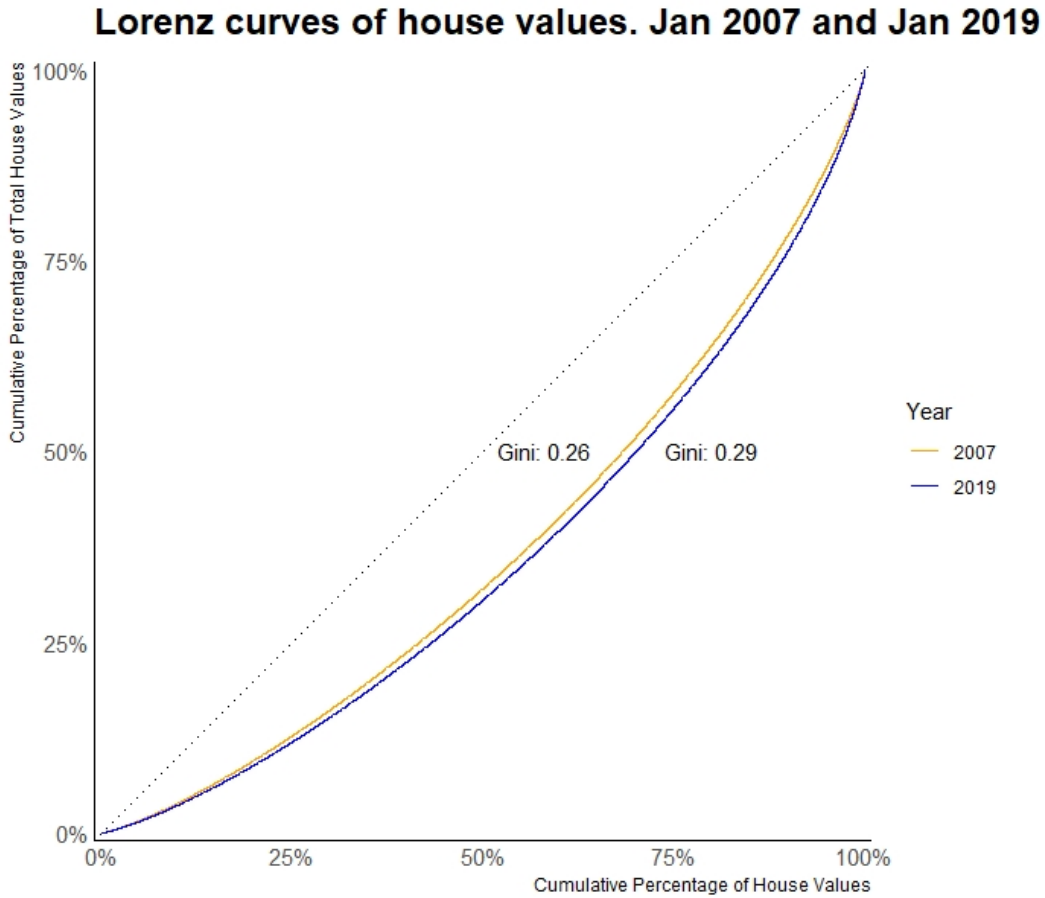
# Lorenz curve house values

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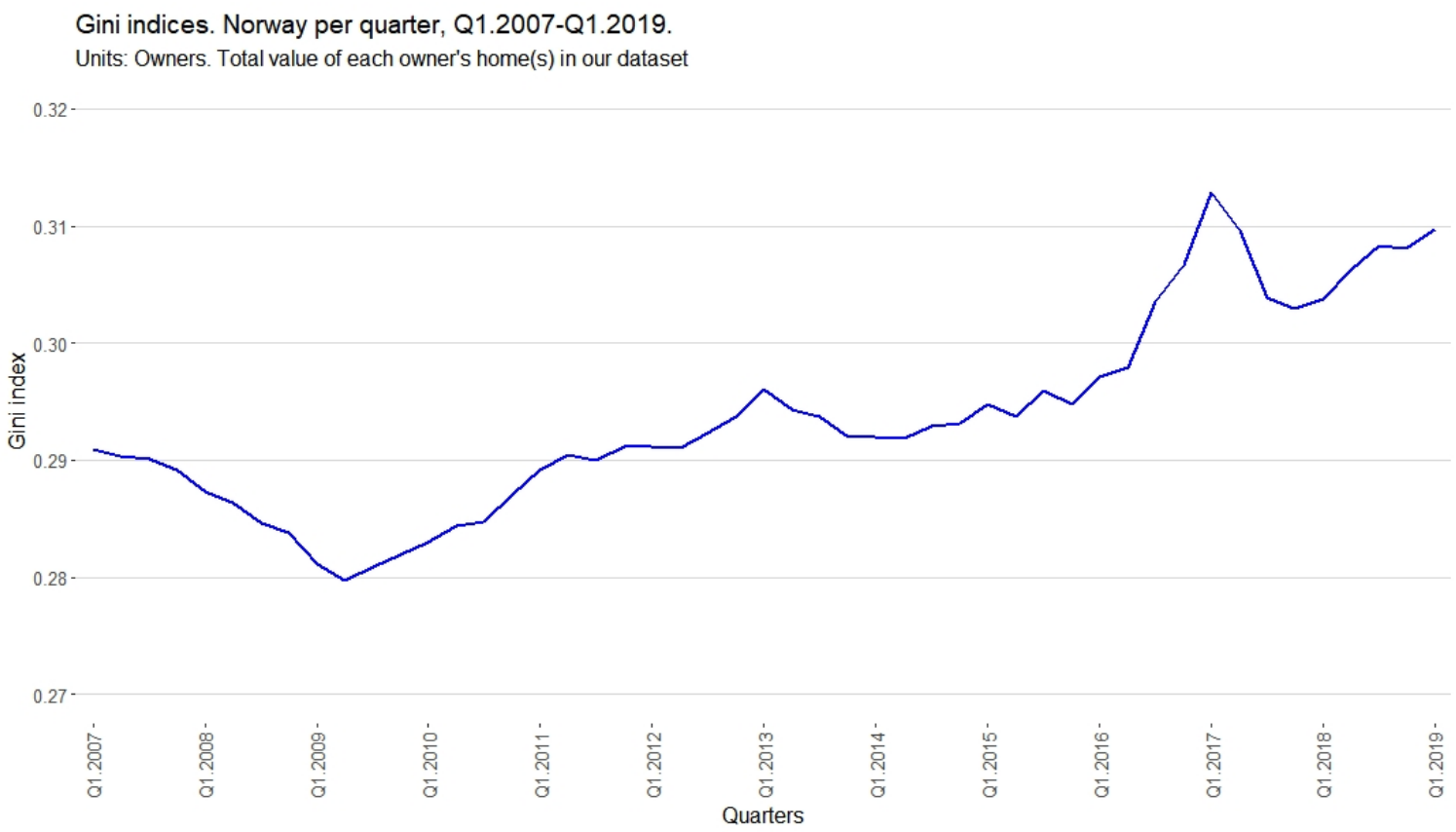
# Gini indices of owner values

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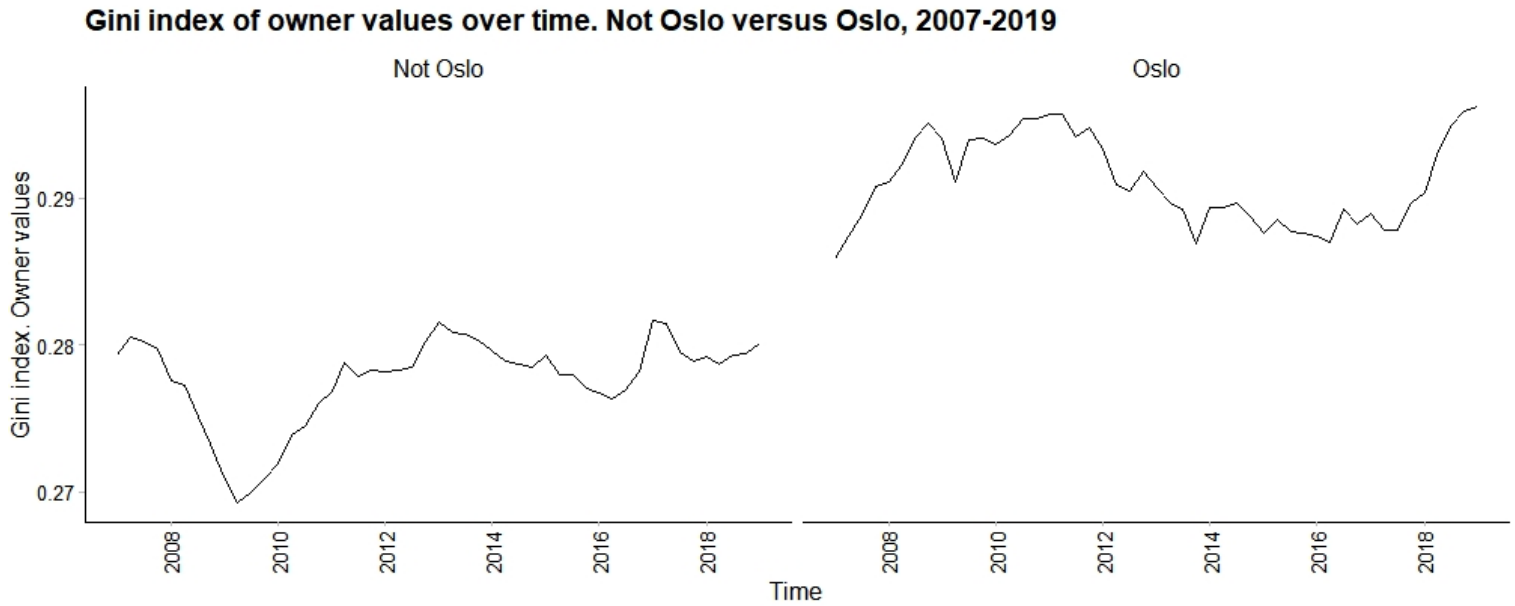
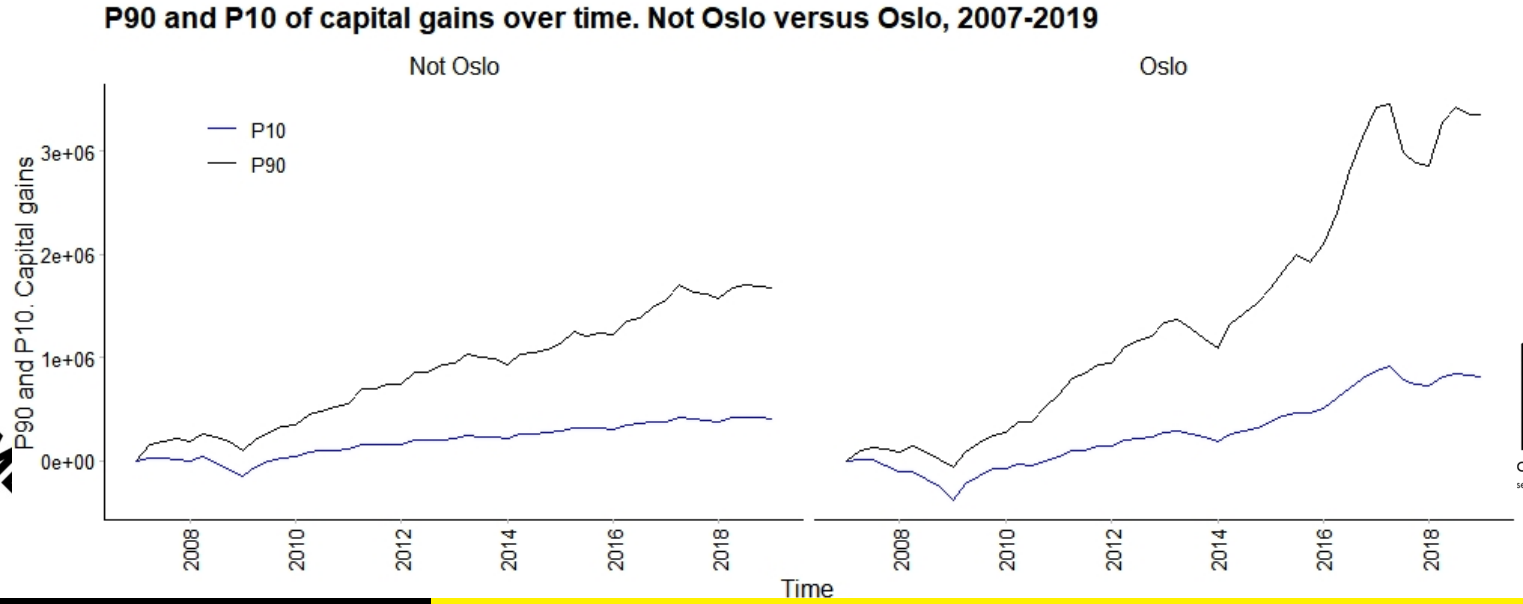
# Gini index over time and P90 and P10 capital gains



# Granger causality house price index and capital gains dispersion

Tests of Granger causality

$HP_t = \alpha + \beta_1 L(HP_t) + \beta_2 L(I_t) + e_t,$
$I_t = \theta_0 + \theta_1 L(I_t) + \theta_2 L(HP_t) + u_t,$

$HP_t = \alpha + \beta_1 L(HP_t) + e_t,$
$I_t = \theta_0 + \theta_1 L(I_t) + u_t$

| Smoothing | Number of lags, F-statistic (p-value) | | |
|---|---|---|---|
| | L1 | L2 | L3 |
| HP Granger-causes I | 9.1 (0.0041) | 2.7 (0.079) | 1.7 (0.19) |
| I Granger-causes HP | 1.1 (0.29) | 1.1 (0.35) | 0.32 (0.81) |

| No smoothing | Number of lags, F-statistic (p-value) | | |
|---|---|---|---|
| | L1 | L2 | L3 |
| HP Granger-causes I | 9.5 (0.0036) | 3.5 (0.040) | 3.6 (0.023) |
| I Granger-causes HP | 0.93 (0.34) | 1.7 (0.20) | 1.5 (0.23) |

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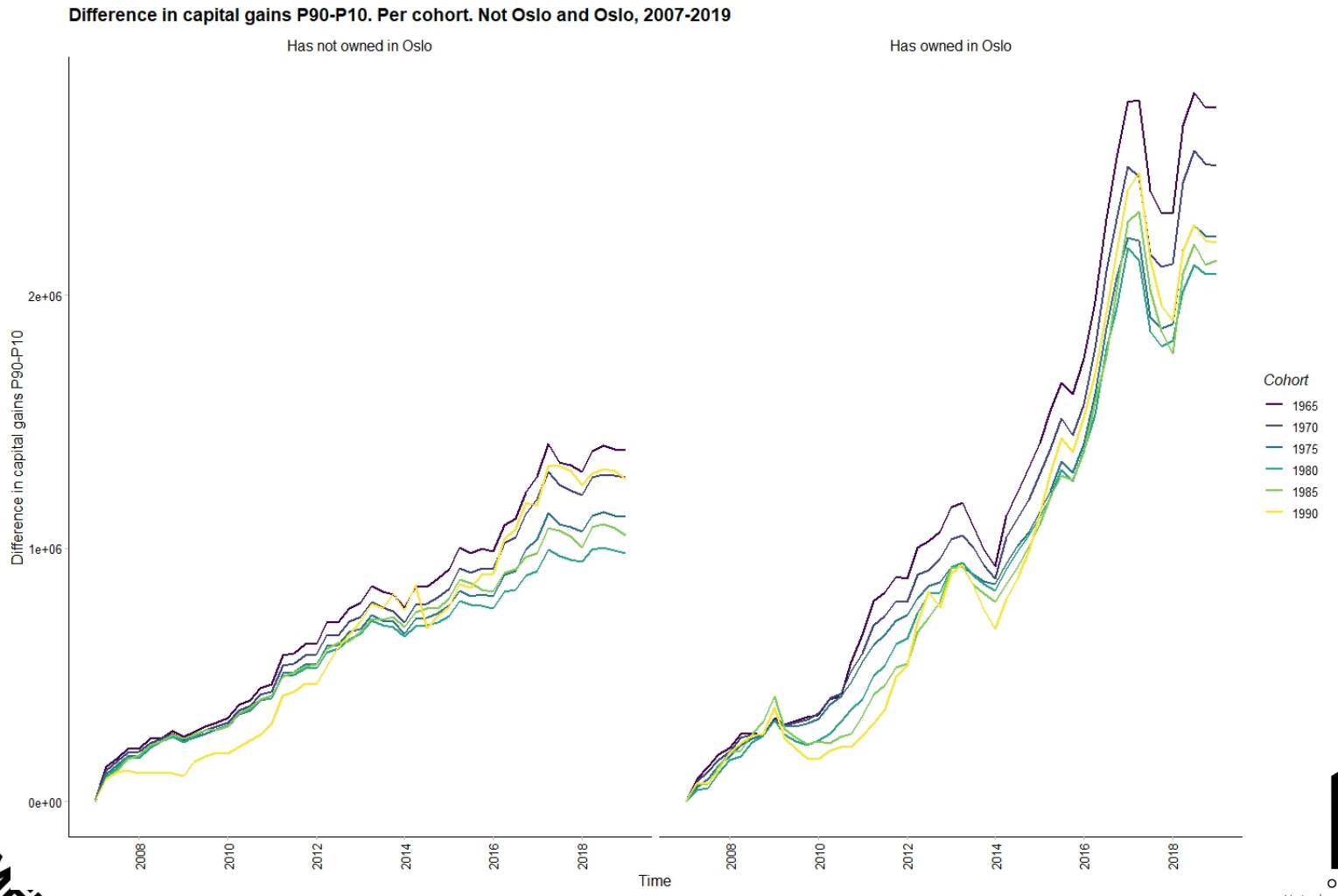
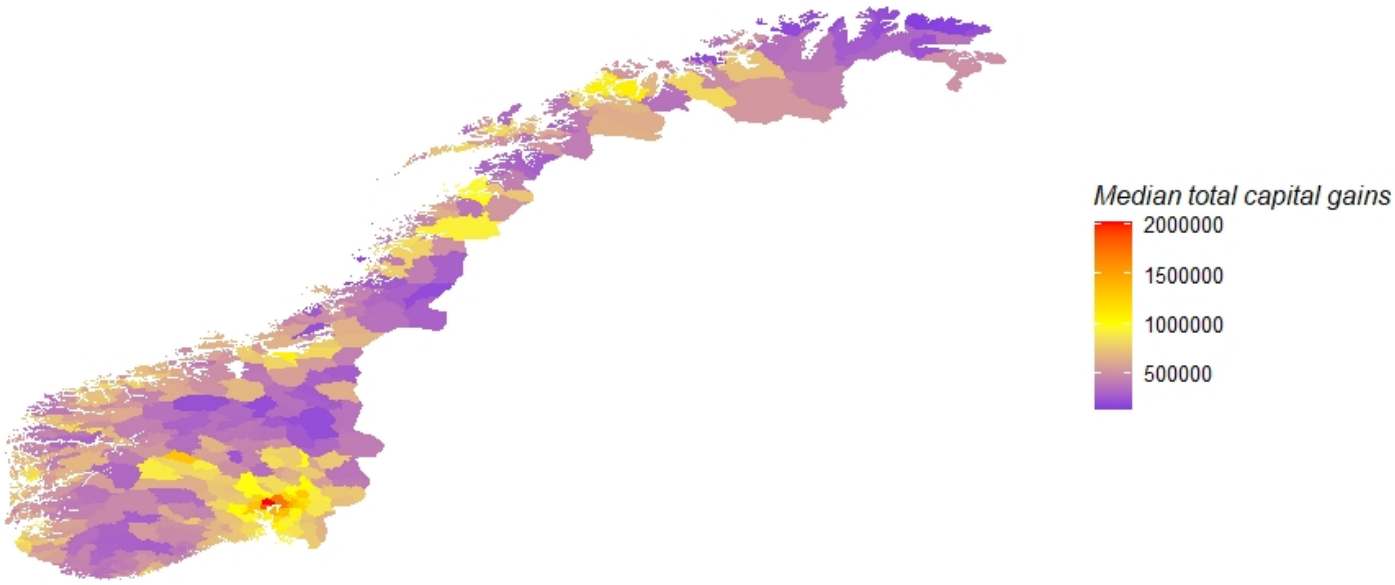
# Geography

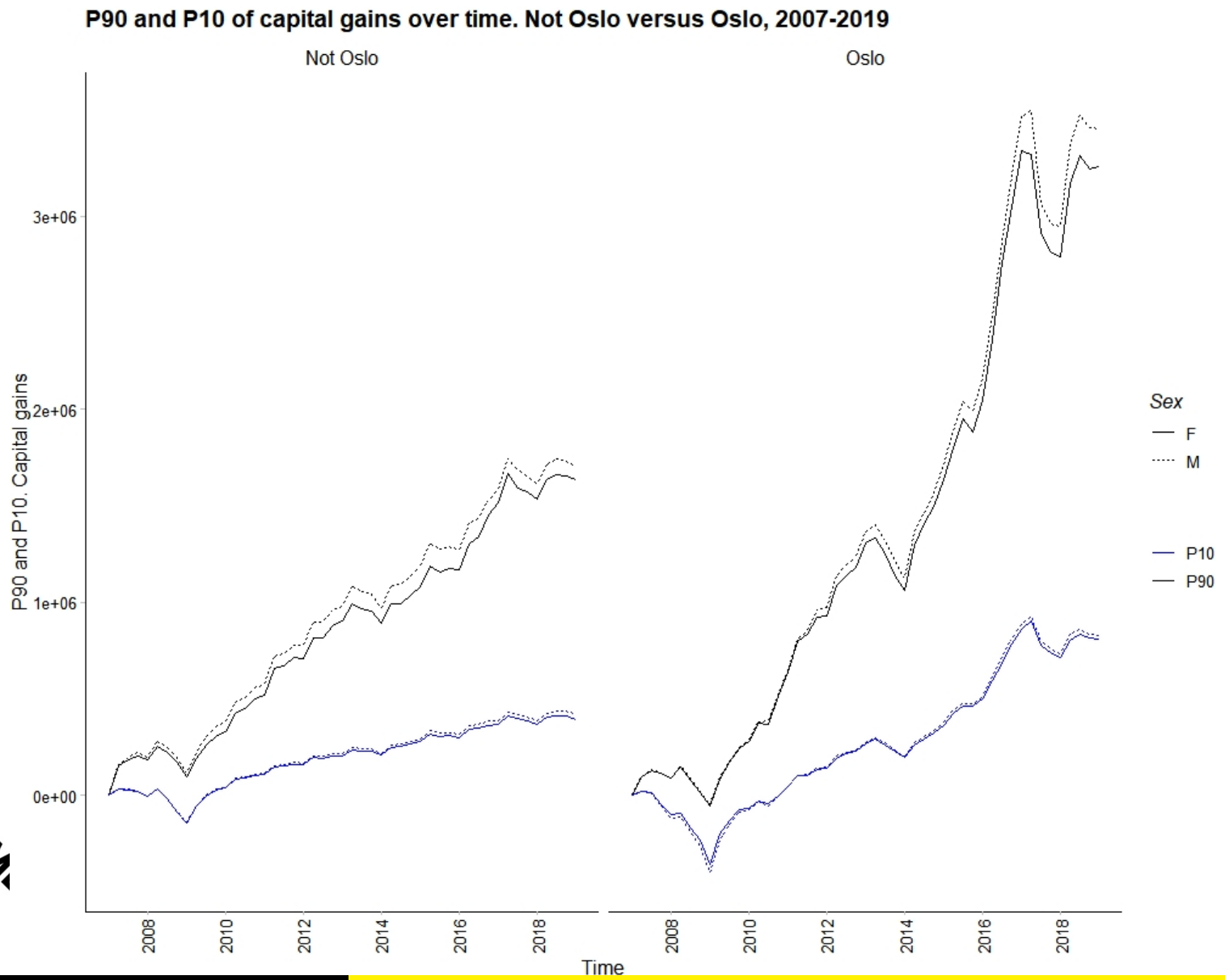

Difference in capital gains P90-P10. Per cohort. Not Oslo and Oslo, 2007-2019
Has not owned in Oslo
Has owned in Oslo
Difference in capital gains P90-P10
2e+06
1e+06
0e+00
2008
2010
2012
2014
2016
2018
Time
Cohort
1965
1970
1975
1980
1985
1990

# Geography II

**Median capital gains across individuals. Within Norwegian municipalities, 2007-2019**



# Females vs males



# Concluding remarks and policy implications

- We follow a panel of owners
- Cohorts 1965-1990
- Large differences in capital gains, P90-P10
- Different picture using Gini on owner values
- Some differences between males and females in high capital gains segments
- Regularities across cohorts and geography

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