Preferences of Higher Educated Households for Location Characteristics and Housing Types

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Based on joint work with

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Research strategy

- Estimating household preferences based on revealed preferences
- Differentiating between household types
- Using estimating results to predict effects of scenarios and policy

Structure of presentation

- Sorting model
- Data description
- Estimation results
- Scenario analysis
- Conclusions

Sorting model

- Input of the model: current housing supply and current household population
- Households choose a region and a housing type based on regional characteristics and household preferences
- Which household preferences will lead to the current equilibrium?

- Sorting model
- Data
- Results
- Scenario analysis
- Conclusions

Sorting model

- Core is a multinomial logit model
- Number of alternatives: 472
  (118 regions x 4 housing types)

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- Utility of household *i* in alternative *n*:

$$u_{in} = \alpha_i P_n + \beta_i X_n + \xi_n + \varepsilon_{in}$$

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  (118 regions x 4 housing types)
- Utility of household *i* in alternative *n*:

$$u_{in} = \alpha_i P_n + \beta_i X_n + \xi_n + \varepsilon_{in}$$

- Probability that household *i* chooses alternative *n*:

$$\pi_{in} = \frac{e^{\widehat{u_{in}}}}{\sum e^{\widehat{u_{in}}}}$$

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Endogeneity problem

- Unobserved characteristics influence utility and household prices
  - Housing prices
  - Accessibility
  - Urban amenities
  - Nature
  - Unobserved characteristics

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Endogeneity problem

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Estimation strategy

- Solution: estimation in two steps

$$u_{in} = \alpha_i P_n + \beta_i X_n + \xi_n + \varepsilon_{in}$$

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Estimation strategy

- Solution: estimation in two steps

$$u_{in} = \alpha_i P_n + \beta_i X_n + \xi_n + \varepsilon_{in}$$

$$\alpha_i = \alpha + \alpha_1(edu_i - \overline{edu}) \qquad \beta_i = \beta + \beta_1(edu_i - \overline{edu})$$

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- Step 1: estimate α_1 and β_1 and an alternative specific constant (asc = $\alpha P_n + \beta X_n + \xi_n$)

- Step 2: explain the asc's based on characteristics of alternatives using 2SLS

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Data (households)

- Data are obtained from *Woon Onderzoek Nederland* (WoON) 2012
- 57,276 households
- Household characteristics

	Mean	Min.	Max.
Couple	0.63	0	1
Children in household	0.35	0	1
Higher education	0.30	0	1
Age	51.7	17	100

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Data (regions)

- 118 regions based on 415 adjacent municipalities

- Sorting model
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Data (regions)

- Every region provides four alternatives (rentel houses and three types of owner-occupied houses)
- Regional characteristics

	Mean	Min.	Max.
Distance to nearest 100,000 jobs (in km)	12.6	3.6	32.8
Distance to intercity train station (in km)	7.5	1.5	27.8
Distance tot highway onramp (in km)	4.1	1.0	20.3
Share of surface is nature (in %)	13.8	0.4	65.8
Size of historical city centre (in km^2)	0.9	0	13.3

- Prices of owner-occupied houses differ by type

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Data (regions)

- Price of a standard house is determined using a hedonic price analysis on transaction data

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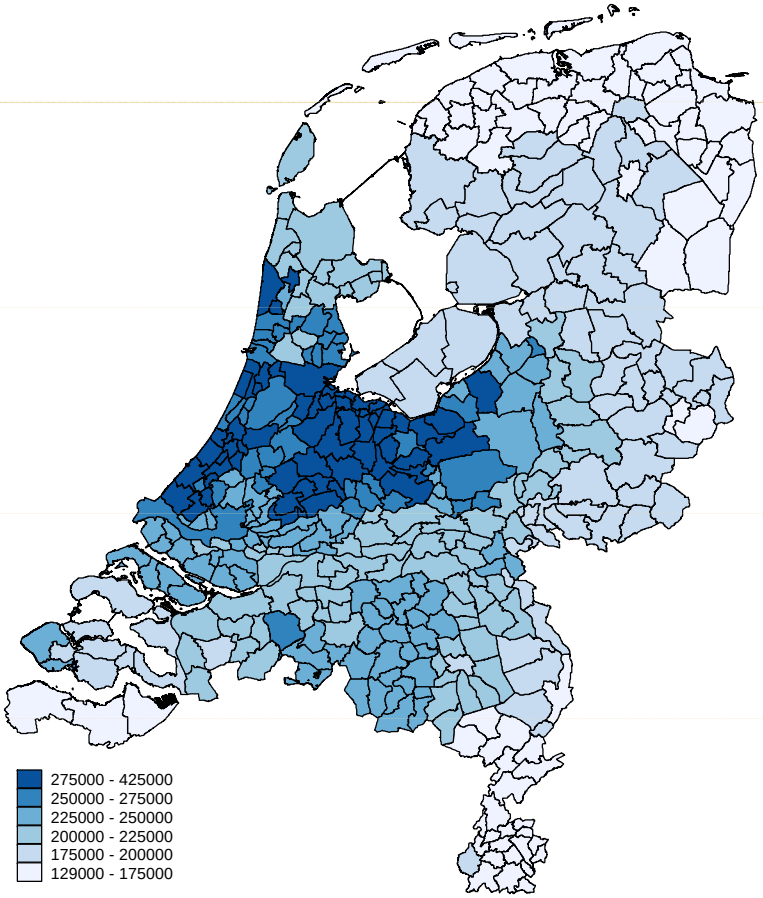

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Willingness to pay

- Sorting model
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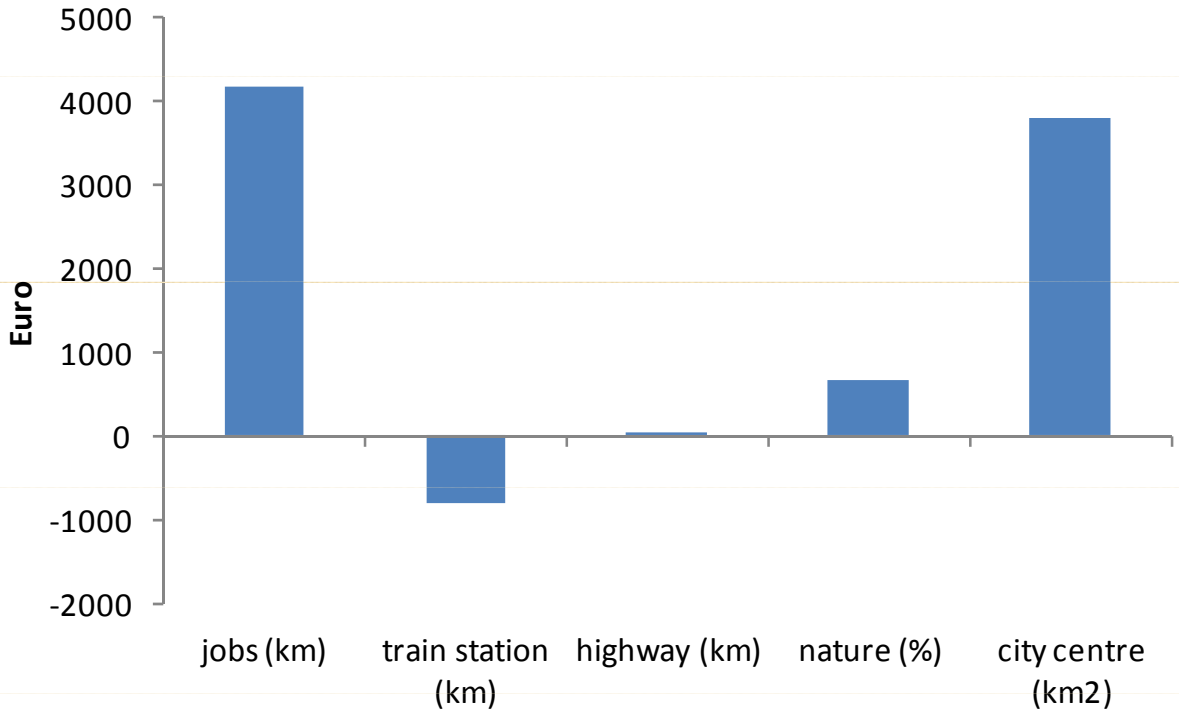

Willingness to pay

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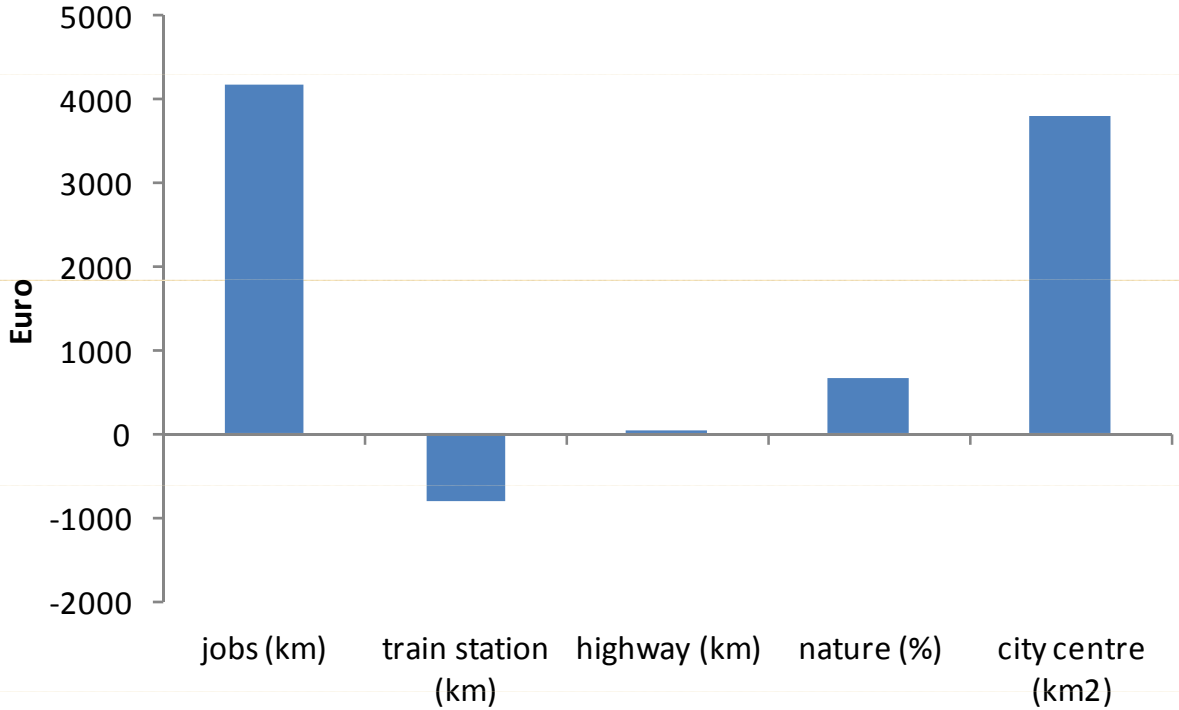


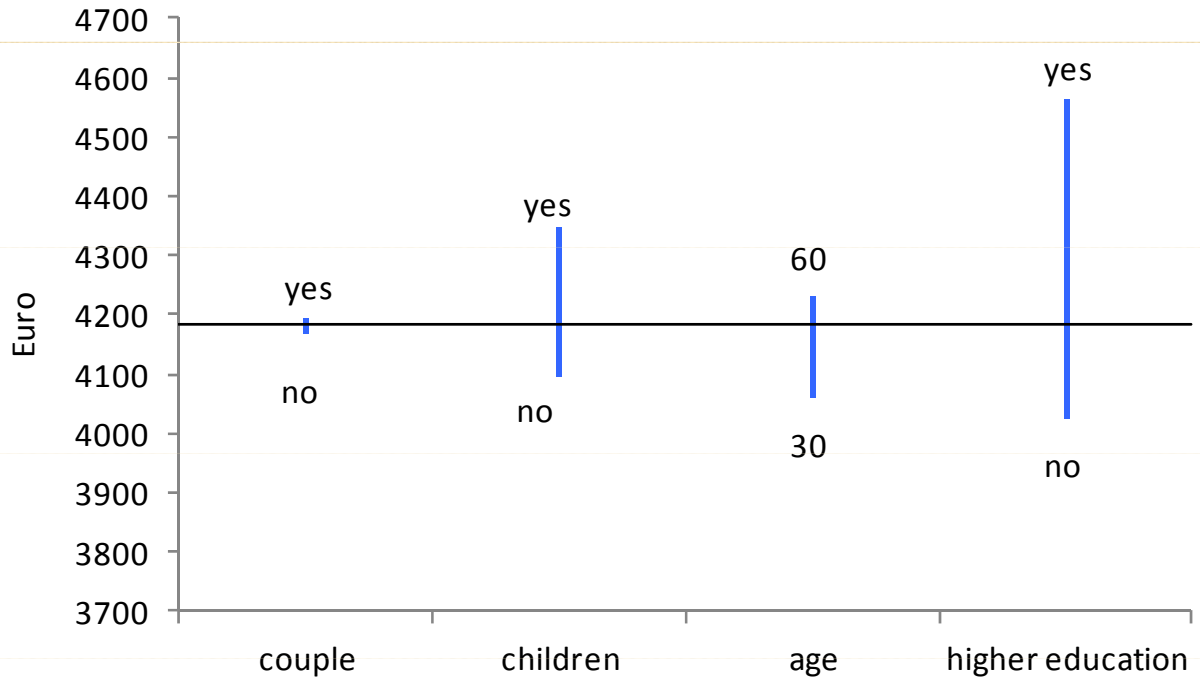
Apartment: reference type

Terraced housing: – 500

Detached housing: 39.000

WTP by household type

- For 1 km higher proximity to nearest 100,000 jobs



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WTP by household type

- For detached housing (relative to apartments)

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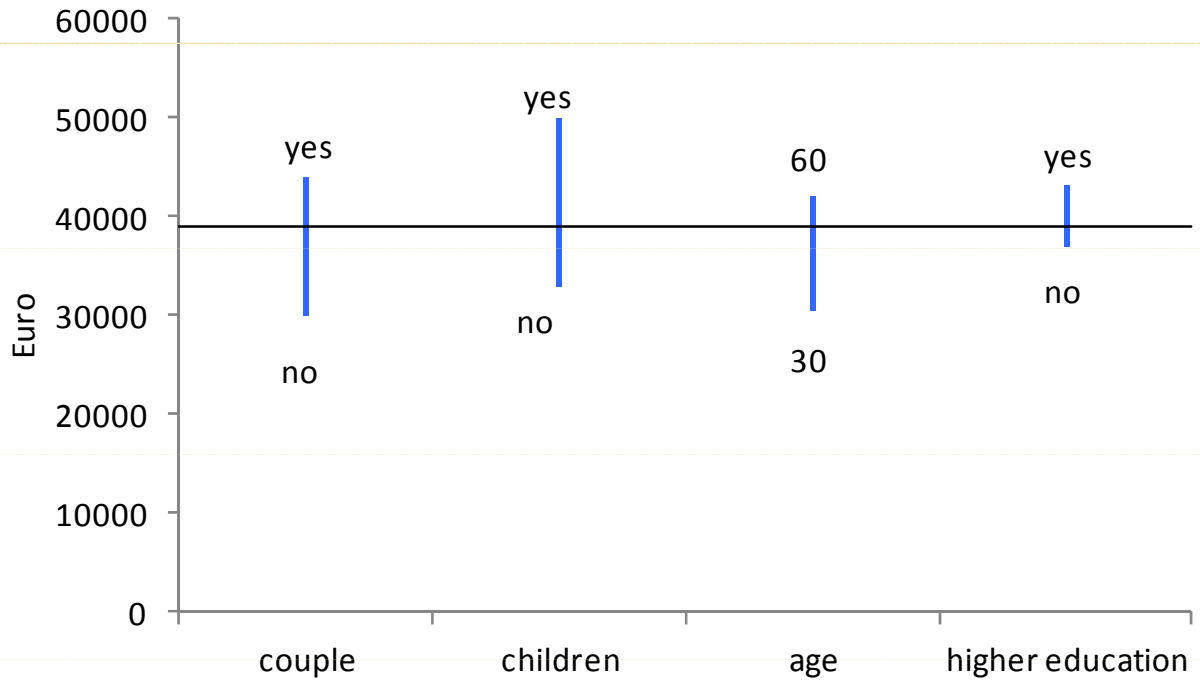

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Scenario analysis

- Estimated parameters for household preferences allow us to sort a given population of households over the alternatives

- Scenario input:
  - Distribution of household types (e.g. education, age)
  - Regional characteristics(e.g. distance to jobs, nature)
  - Housing supply(distribution between regions and composition of housing types within regions)

- Scenario output:
  - Housing prices
  - Composition of household types for each region

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Global economy 2030 scenario

- Example: housing supply in 2030 based on *Ruimte Scanner XL*
- Global Economy scenario

- Assumption: number of houses is equal to number of households

- Household demographics and regional characteristics remain constant

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Global economy 2030 scenario

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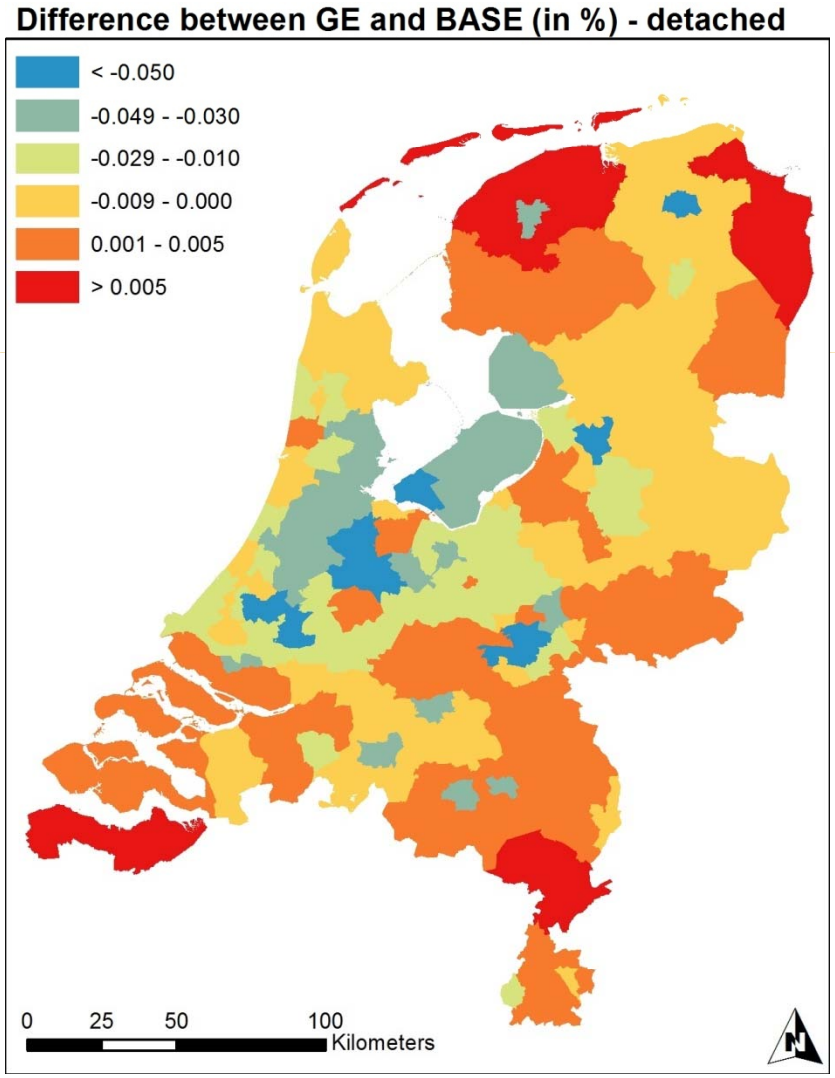

Price change of detached housing

Global economy 2030 scenario

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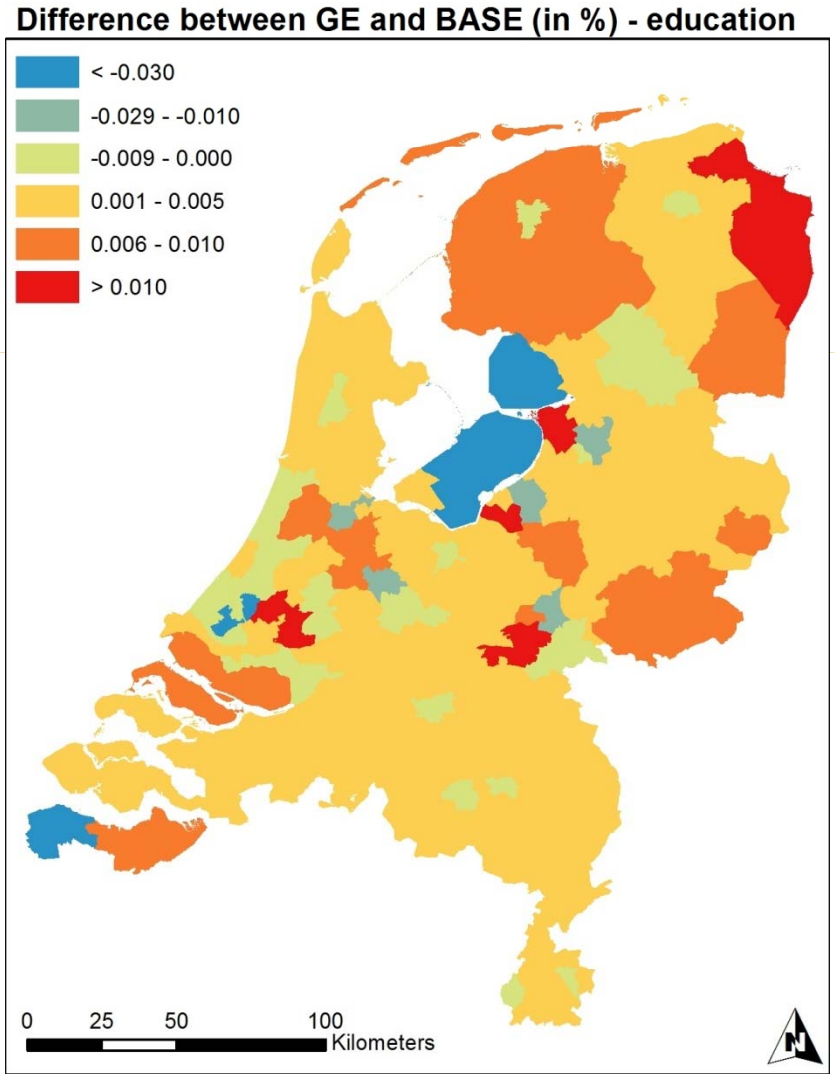

Change in share of higher educated households

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Conclusions

- Sorting model uses revealed preferences to determine willingness to pay for regional characteristics

- Can distinguish between household types

- We find a positive willingness to pay for proximity to jobs, availability of nature and urban amenities, and for detached housing

- Estimation results can be used to predict the effects of scenarios and policy on housing prices and regional household composition

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Alternative models

- Estimating the sorting model with different characteristics of households and regions
  - foreign knowledge workers and students
  - field of education or profession
- Different level of aggregation (e.g. neighbourhoods instead of municipalities)
- Estimating costs of moving (using distance to previous region)

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