Location choices of highly educated foreign workers: the importance of urban amenities

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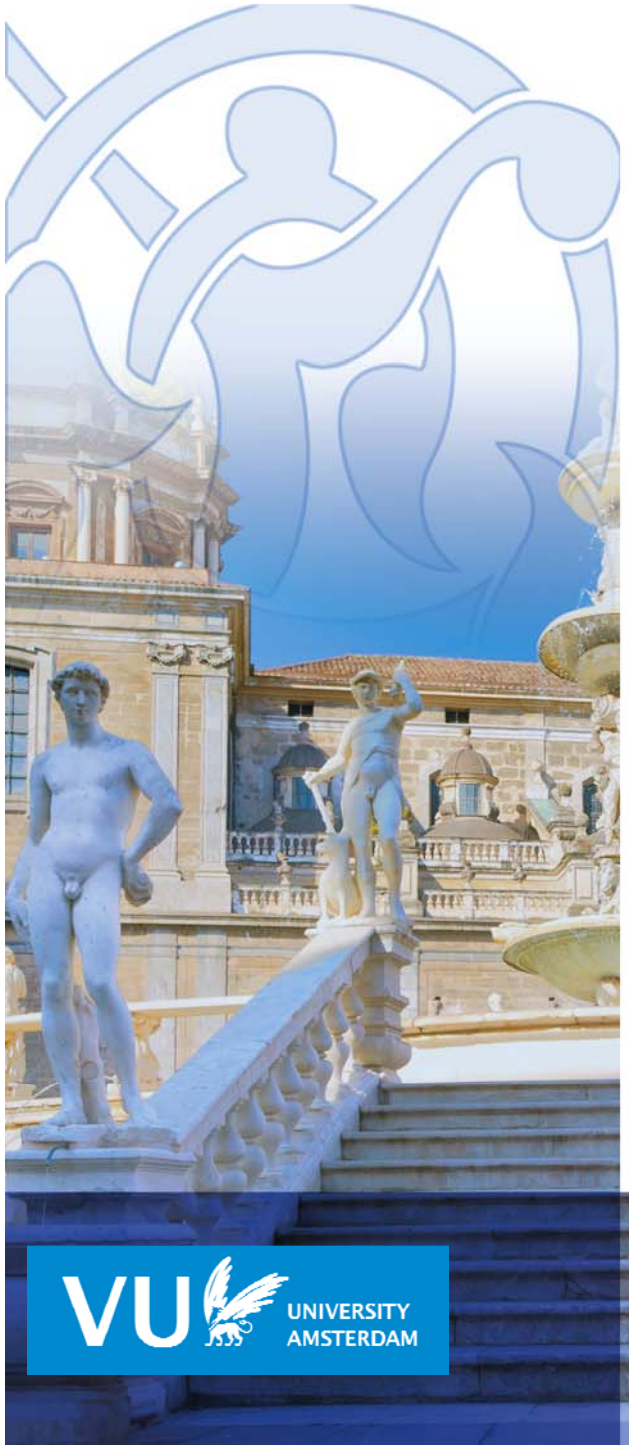
Abstract

Current developed economies' growth becomes increasingly dependent on the performance of innovation and skill-intensive industries. Therefore, the ability of cities to attract skilled or highly-educated individuals becomes more and more important for their growth and economic development. In this research we estimate a residential sorting model in order to shed light on the factors that determine the location choices of foreign skilled workers. We do so by estimating their valuation of various urban amenities in the municipalities of the densely populated province of Zuid-Holland, and investigating which amenities increase the attractiveness of these municipalities. We also consider heterogeneity in individual preferences, and compare housing preferences and marginal willingness to pay for amenities between groups based on skill levels and origin. We find that work related amenities such as jobs, accessibility and concentration of knowledge intensive industries, are highly valued by both domestic and migrants with high-education. Our results also provide evidence that social amenities, such as an existing community of migrants in a municipality, has an important role in determining the attractiveness of a location.



Location choices of highly educated foreign workers: the importance of urban amenities

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Introduction

- Current developed economies are increasingly dependent on **innovation and skill-intensive industries.**
- Cities' growth potential depend on their ability to attract workers with high human capital.

- **In this research we use estimations of the sorting model to:**
  - **Investigate the location preferences of skilled migrants, and their valuation of urban amenities.**
  - **Compare preferences of different population groups.**
  - **Calculate marginal willingness to pay for urban amenities.**

- Preliminary stages of research

Method

- Residential sorting model (Bayer, McMillan, Rueben, 2004)
  - Households maximize their utility by choosing a residential location.
  - Households with different characteristics have different preferences, and they value urban amenities differently.
  - The sorting model allows estimating choice probabilities, and calculating (average and individual) marginal willingness to pay values.

Method (II)

- Two step estimation:
  - **First step** – Estimating multinomial logit to obtain:
    1. Choice probabilities (assuming housing market equilibrium)
    2. Cross effect coefficients
    3. Mean indirect utilities from each location
  - **Second step** – Explaining the vector of mean indirect utilities using (instrumented) urban amenities.
  - The coefficients from both steps are used to calculate **MWTP**

Method (III)

- Instruments : Price and share of migrants
  - Instrument rise naturally from the mode – set unobserved element to be equal to zero.
  - Price instrument = Price vector that clears the market assuming no unobserved heterogeneity
  - Share of migrants instrument – The counterfactual share of migrants that would prevail if no unobserved amenities exist.

The sorting model – estimation of the steps

$$V_{i,n} = \sum_{k=1}^{K} \beta_{0,k} X_{k,n} + \xi_n + \sum_{k=1}^{K} \left(\sum_{l=1}^{L} \beta_{k,l} \left(Z_{i,l} - \bar{Z}_l \right) \right) X_{k,n} + \varepsilon_{i,n}$$

$$V_{i,n} = \delta_n + \sum_{k=1}^{K} \left(\sum_{l=1}^{L} \beta_{k,l} \left(Z_{i,l} - \bar{Z}_l \right) \right) X_{k,n} + \varepsilon_{i,n}$$

1

$$Pr_{i,n} = \frac{e^{V_{i,n}}}{\sum_{n=1}^{N} e^{V_{i,n}}} \quad , \quad \sum_{i=1}^{I} Pr_{i,n} = S_n$$

2

$$\delta_n = \sum_{k=1}^{K} \beta_{0,k} X_{k,n} + \xi_n$$

Marginal willingness to pay

$$\frac{\delta P_n}{\delta X_{k,n}} = \frac{\left(\beta_{0,k} + \sum_{l=1}^{L} \beta_{k,l}\left(z_{i,l} - \bar{z}_l\right)\right)}{\left(\beta_{0,p} + \beta_{p,l}\left(z_{i,l} - \bar{z}_l\right)\right)} P_n$$

$$\frac{\delta P_n}{\delta X_{k,n}} = \frac{\beta_{0,k}}{\beta_{0,p}} P_n \quad , \quad z_{i,l} = \bar{z}_l$$

Choice of urban amenities and household characteristics

- Urban Amenities:
  - Housing prices
  - Work related: Number of Jobs, Accessibility, ICT sector LQ
  - Recreation and nature: Nature coverage, Official monuments
  - Social: Share of migrants (positive and negative effects)

- Household characteristics: Age, Kids (dummy), Income, Skill level (dummy), Migrant status (dummy).

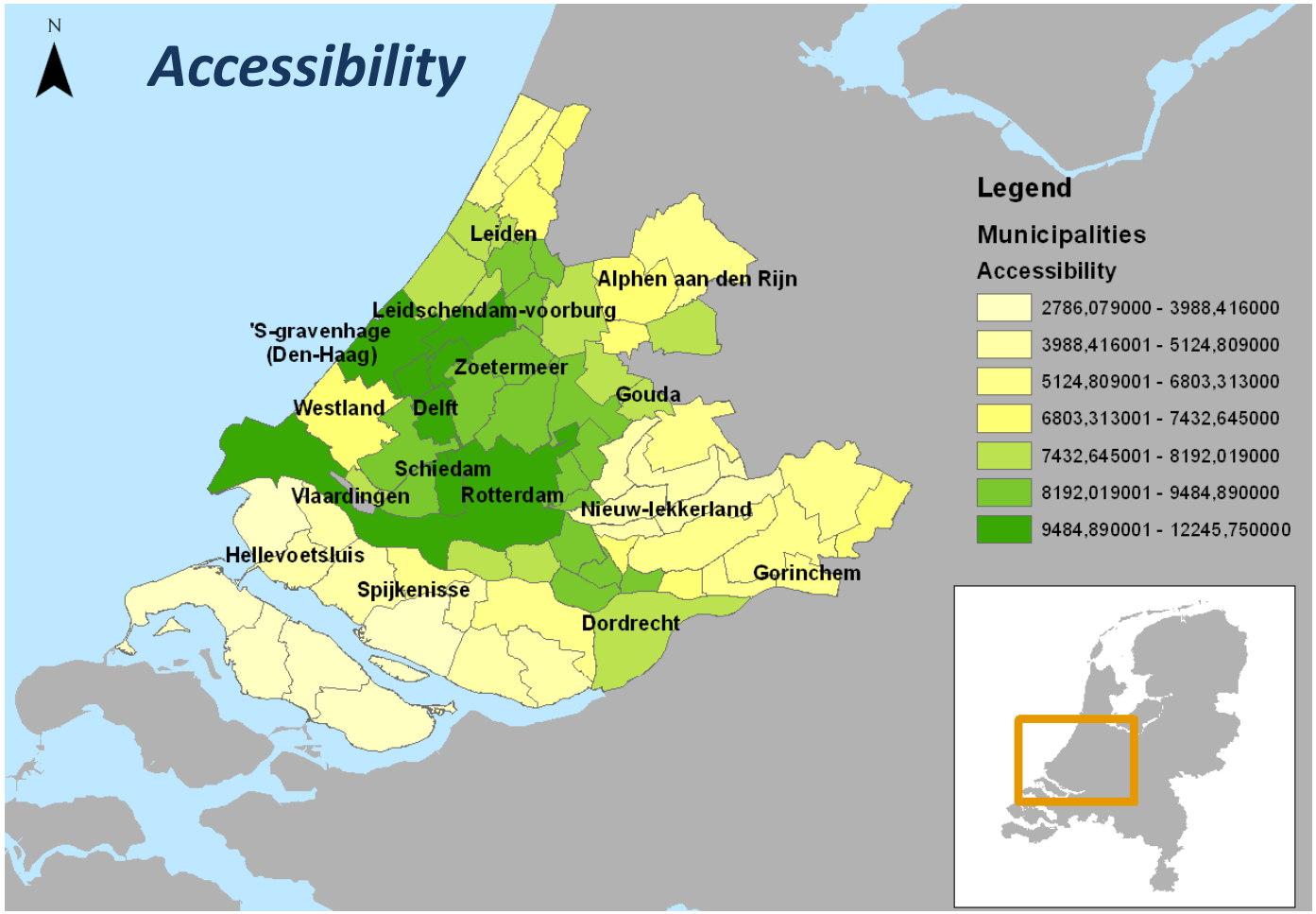
Data and study area

- **Household location choices and characteristics**: WoON 2012 housing survey (BZK)
- **Urban Amenities:** Dutch CBS

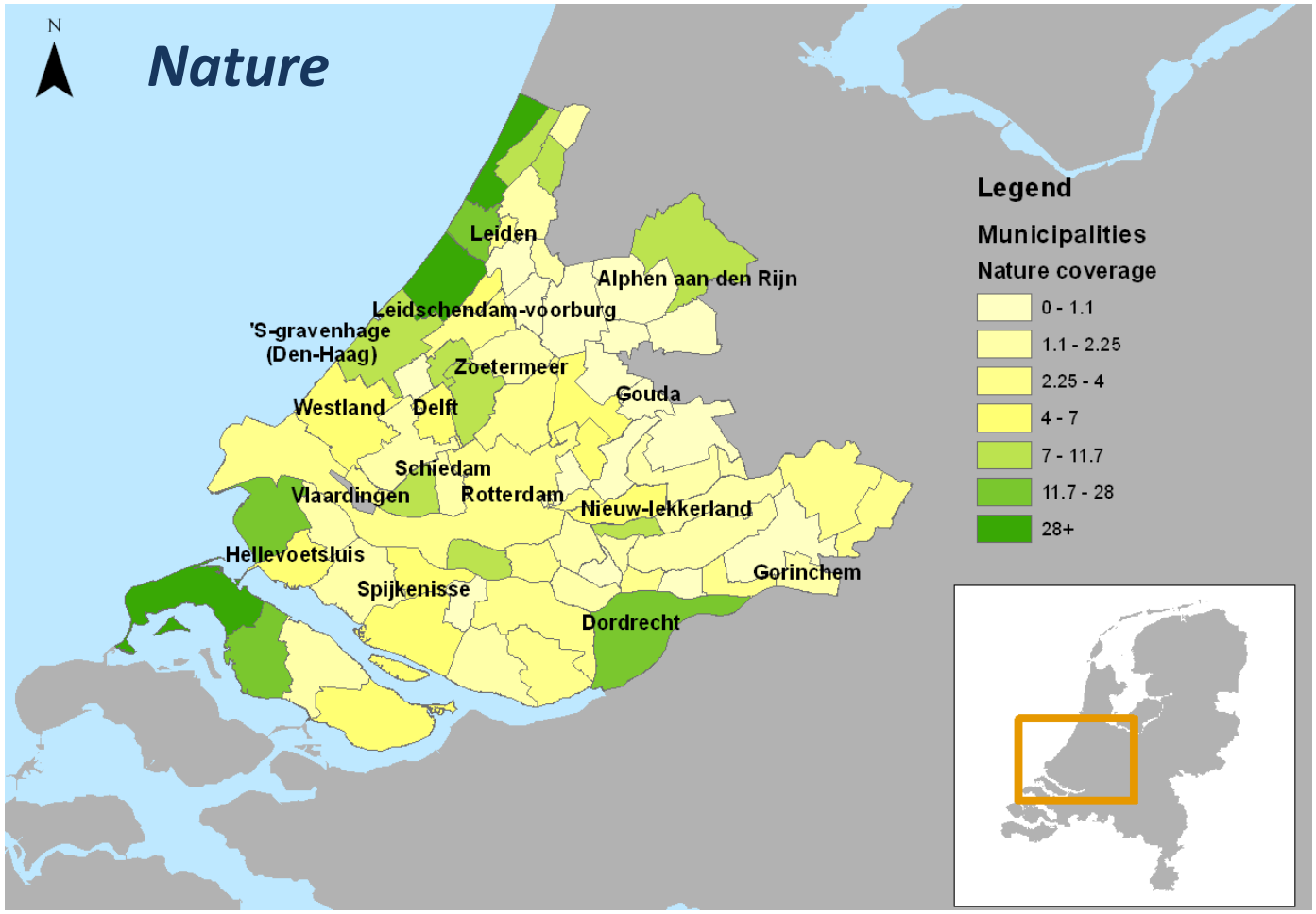
- **Study area:** 71 municipalities in the province of Zuid-Holland (incl. Rotterdam, Den-Haag, Leiden, Delft, Dordrecht and Gouda)

Dutch Islands
Groningen
Frysland
Drenthe
Noord Holland
Flevoland
Amsterdam
Overijssel
Gelderland
Zuid Holland
Utrecht
Noord-Brabant
Zeeland
Limburg
Hillegom
Noordwijkerhout
Lisse
Noordwijk aan Zee
Sassenheim
Katwijk
Oude Wetering
Mijdrecht
Oegstgeest
LEIDEN
Ter Aar
Wassenaar
Voorschoten
ALPHEN a.d. RIJN
Nieuwkoop
Zoeterwoude
Hazerswoude Dorp
DEN HAAG
Leidschendam
Woerden
Voorburg
ZOETERMEER
Boskoop
Bodegraven
Rijswijk
Nootdorp
Waddinxveen
Moerkapelle
Monster
Wateringen
Pijnacker
GOUDA
Oudewater
's-Gravenzande
Bleiswijk
Hoek van Holland
Naaldwijk
DELFT
Berkel en Rodenrijs
Haastrecht
De Lier
Lopik
VIANEN
Nieuwerkerk a.d. IJssel
Stolwijk
Maasdijk
Lexmond
Schoonhoven
Ameide
Capelle a.d. IJssel
Ouderkerk a.d. IJssel
Maassluis
Nieuwpoort
VLAARDINGEN
Schiedam
Krimpen a.d. IJssel
Oostvoorne
ROTTERDAM
Brielle
Krimpen a.d. Lek
Lekkerkerk
LEERDAM
Rockanje
Ridderkerk
Alblasserdam
Bleskensgraaf
Hoogvliet
Rhoon
Barendrecht
Arkel
Hellevoetsluis
Spijkenisse
Hendrik-Ido-Ambacht
Papendrecht
Goedereede
Zuidland
Oud Beijerland
Zwijndrecht
Sliedrecht
GORINCHEM
Ouddorp
Stellendam
Nieuw Beijerland
Puttershoek
DORDRECHT
Mijnsheerenland
's-Gravendeel
Klaaswaal
Middelharnis
Dirksland
Zuid Beijerland
Strijen
Numansdorp
Oude Tonge

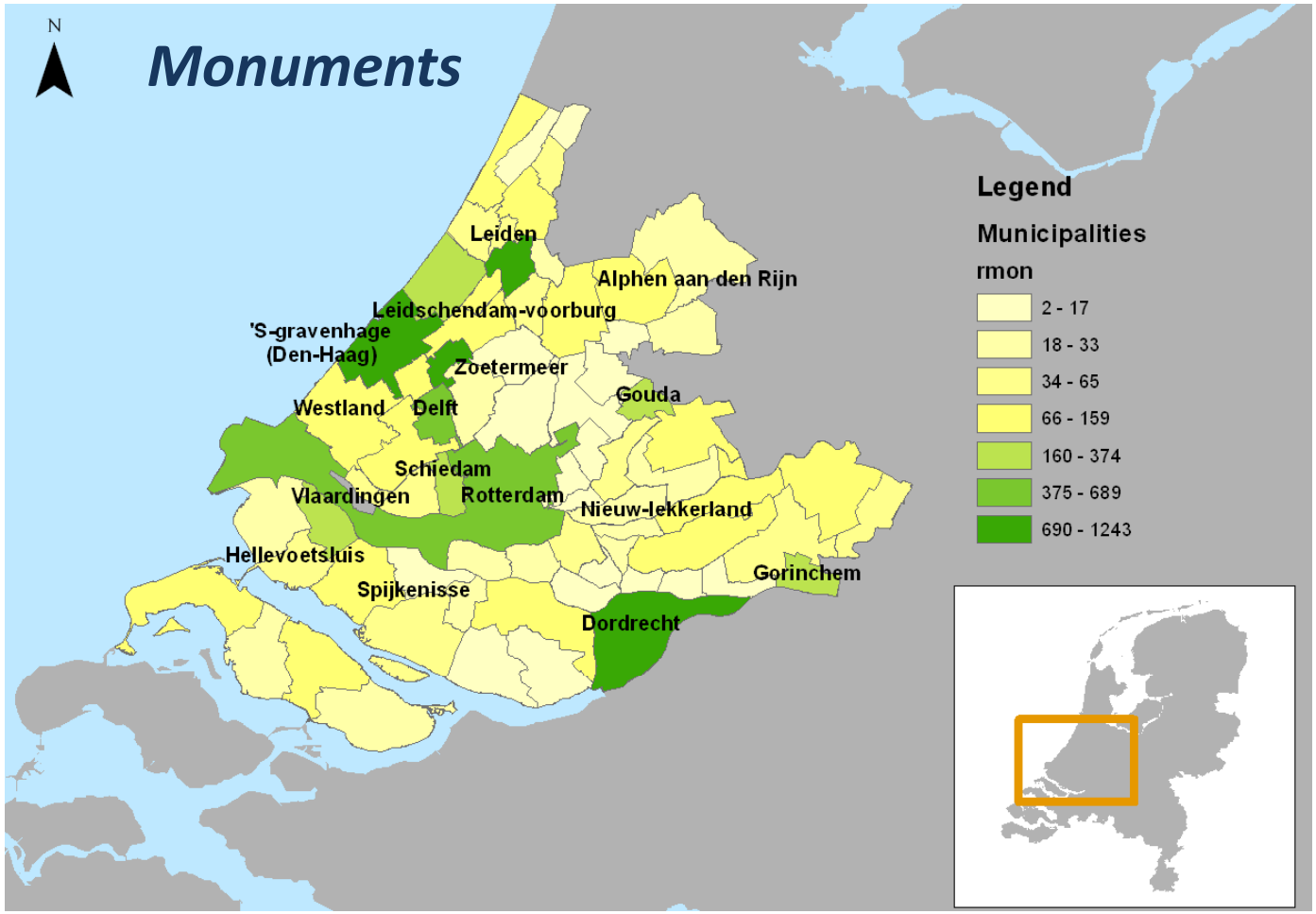
Zuid-Holland - Provision of urban amenities



Zuid-Holland - Provision of urban amenities



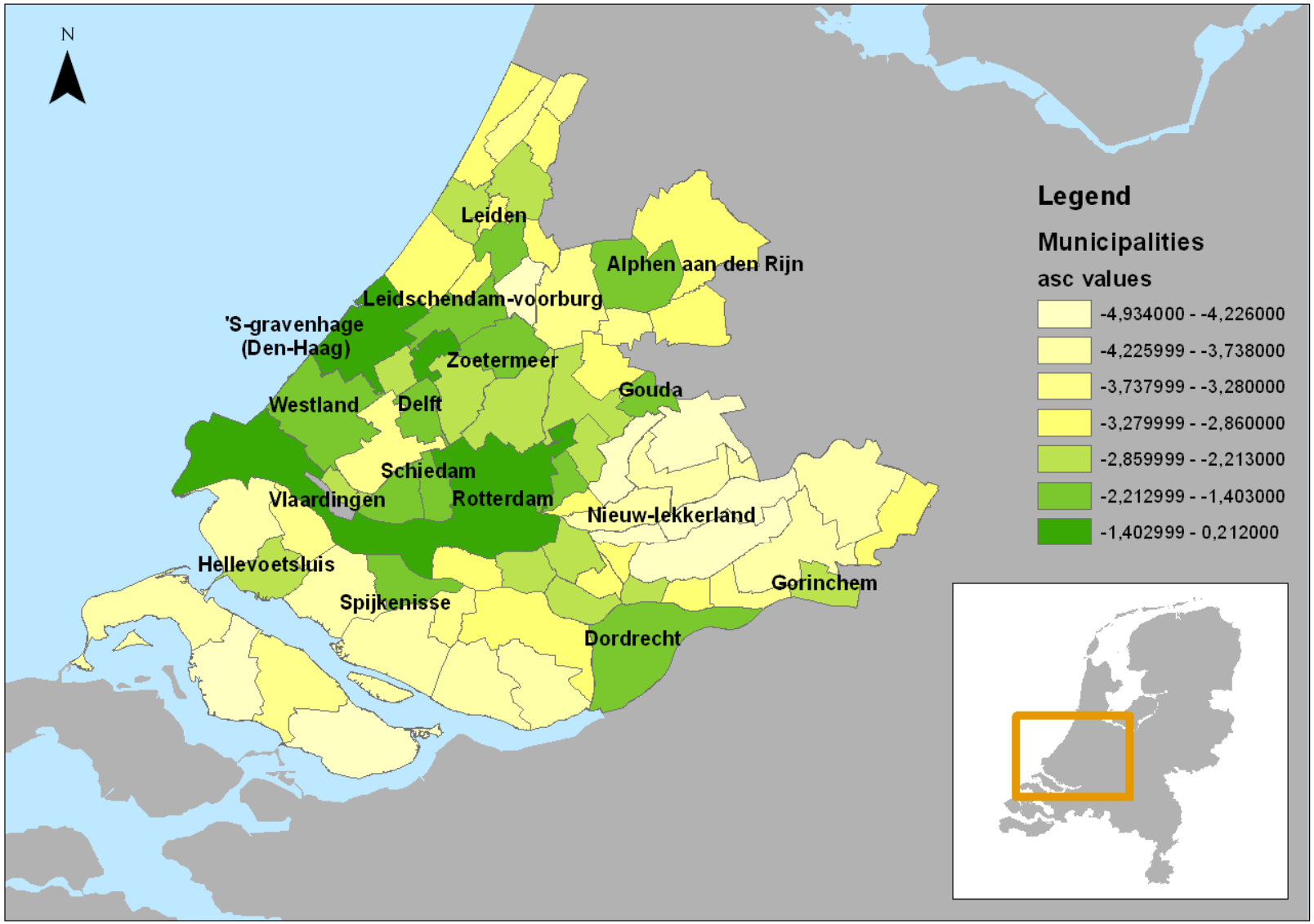
Zuid-Holland - Provision of urban amenities



Results – first step (I)

Table 8 - First step results (Specification 2)					
Alternative characteristics					
	Individual characteristics				
	Age	Kids	ln(Income)	migrant	skilled
ln_Price	0.0102	0.562**	-0.0778	-0.342	1.753***
	(0.00652)	(0.238)	(0.178)	(0.269)	(0.238)
P.mig	6.30e-05	-0.0455***	-0.00307	0.132***	0.0713***
	(0.000406)	(0.0146)	(0.0124)	(0.0187)	(0.0151)
P.mig^2	5.25e-06	0.00124***	-0.000239	-0.00197***	-0.000583
	(1.11e-05)	(0.000397)	(0.000306)	(0.000477)	(0.000426)
Accessibility	-1.21e-07	9.81e-06	-5.41e-05***	6.49e-05*	4.07e-05
	(8.24e-07)	(2.87e-05)	(1.99e-05)	(3.84e-05)	(3.00e-05)
Jobs	-2.88e-05	-0.00288**	0.00118	0.00232*	-0.00160
	(3.14e-05)	(0.00112)	(0.000800)	(0.00127)	(0.00121)
Monuments	-1.48e-05***	-0.000270***	-0.000308***	-0.000181	0.000440***
	(2.81e-06)	(0.000101)	(6.96e-05)	(0.000112)	(0.000103)
LQ (ICT)	0.00100	-0.0483	0.117***	0.0501	-0.0665**
	(0.000849)	(0.0296)	(0.0219)	(0.0329)	(0.0304)
Nature	0.000162	-0.0187***	0.00732**	0.0148**	-0.0159***
	(0.000132)	(0.00479)	(0.00358)	(0.00613)	(0.00556)

Results – first step (mean ind. Utility)



Results – first step (Cross effects)

Table 8 - First step results (Specification 2)					
Alternative characteristics					
	Individual characteristics				
	Age	Kids	ln(Income)	migrant	skilled
ln_Price	0.0102	0.562**	-0.0778	-0.342	1.753***
	(0.00652)	(0.238)	(0.178)	(0.269)	(0.238)
P.mig	6.30e-05	-0.0455***	-0.00307	0.132***	0.0713***
	(0.000406)	(0.0146)	(0.0124)	(0.0187)	(0.0151)
P.mig^2	5.25e-06	0.00124***	-0.000239	-0.00197***	-0.000583
	(1.11e-05)	(0.000397)	(0.000306)	(0.000477)	(0.000426)
Accessibility	-1.21e-07	9.81e-06	-5.41e-05***	6.49e-05*	4.07e-05
	(8.24e-07)	(2.87e-05)	(1.99e-05)	(3.84e-05)	(3.00e-05)
Jobs	-2.88e-05	-0.00288**	0.00118	0.00232*	-0.00160
	(3.14e-05)	(0.00112)	(0.000800)	(0.00127)	(0.00121)
Monuments	-1.48e-05***	-0.000270***	-0.000308***	-0.000181	0.000440***
	(2.81e-06)	(0.000101)	(6.96e-05)	(0.000112)	(0.000103)
LQ (ICT)	0.00100	-0.0483	0.117***	0.0501	-0.0665**
	(0.000849)	(0.0296)	(0.0219)	(0.0329)	(0.0304)
Nature	0.000162	-0.0187***	0.00732**	0.0148**	-0.0159***
	(0.000132)	(0.00479)	(0.00358)	(0.00613)	(0.00556)

Results – Second step

Table 9 - Second step results (Specifications 1,2)	
	2SLS
VARIABLES	ASC
ln_Price	**-5.578*** **
	(1.279)
Perc. Mig	**0.137*** **
	(0.0353)
Perc. Mig(sqr)	**-0.00590*** **
	(0.00145)
Accessibility	**0.000257*** **
	(6.37e-05)
Jobs	**0.0190*** **
	(0.00478)
Monuments	**0.000549**
	(0.000410)
LQ (ICT)	**0.414*** **
	(0.134)
Nature	**0.0532*** **
	(0.0166)
Constant	**63.46*** **
	(15.80)
Price Inst.	**Yes**
Perc. Migrants inst.	**Yes**
Observations	71
R-squared	0.499
Robust standard errors in parentheses	
*** p<0.01, ** p<0.05, * p<0.1	

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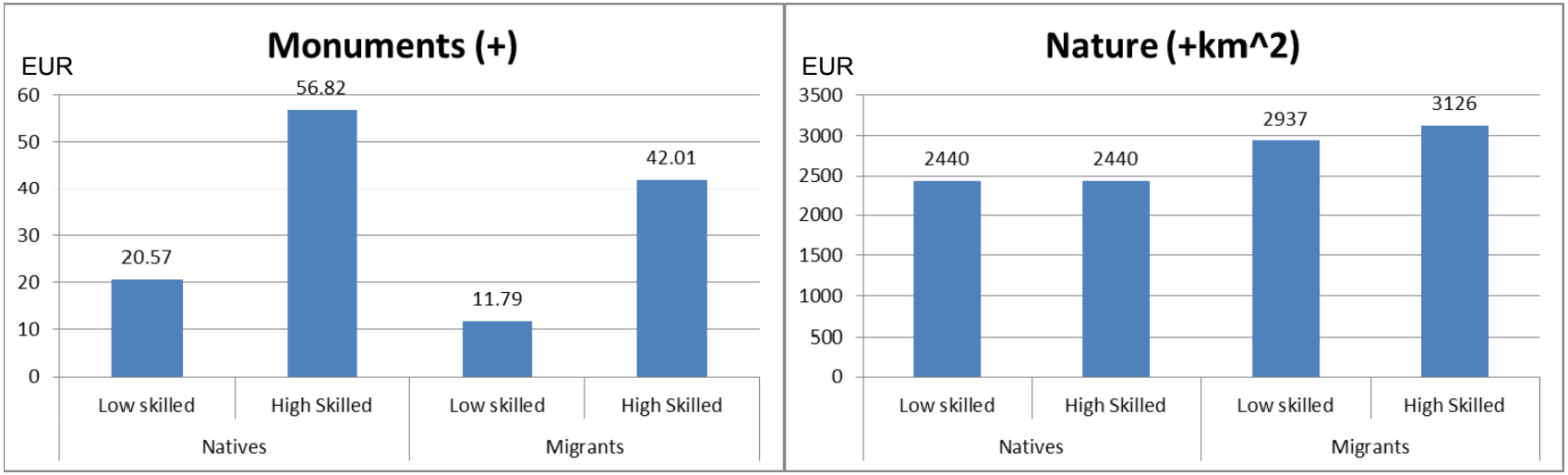
Results - Marginal willingness to pay (III)

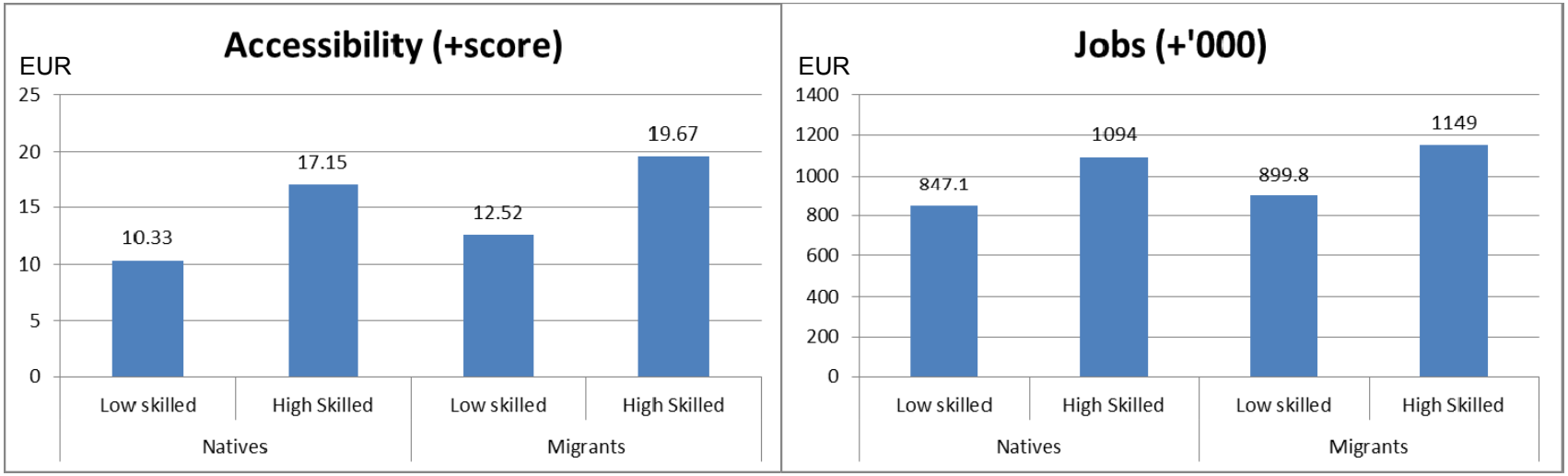
- *MWTP for nature and historical amenities*



- *MWTP for monuments appears to be education based, but with large gaps*
- *MWTP for natural amenities appears to be origin based.*

Results - Marginal willingness to pay (II)

- *MWTP for work-related amenities*



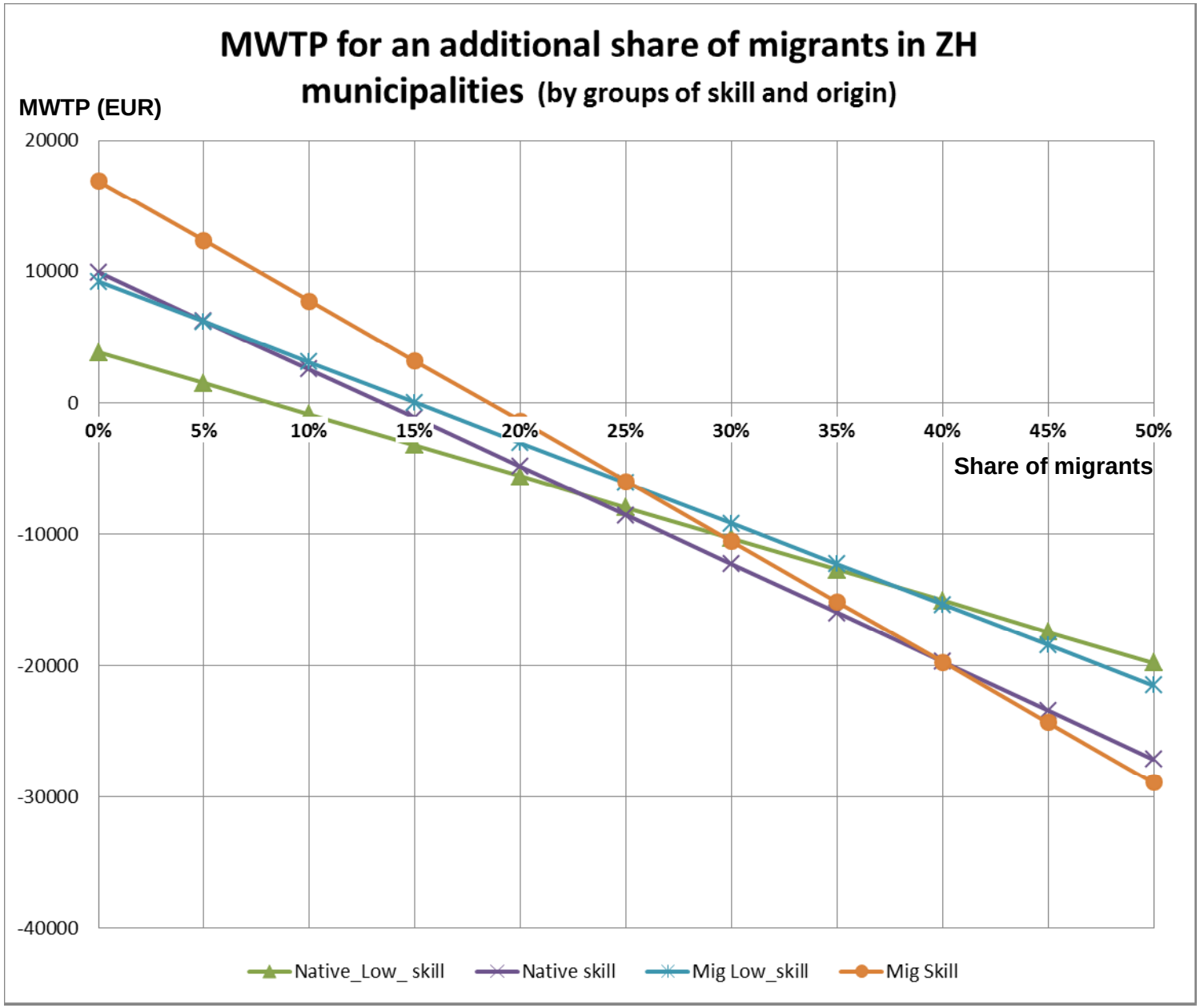
- *Valuation of work related amenities appears to be skill based.*

Results - Marginal willingness to pay (I)

- *MWTP for Share of migrants*

MWTP (EUR)	(1)	(2)	(3)	(4)	(5)
		Natives		Migrants	
Percentage of migrants	Mean	Low skilled	High Skilled	Low skilled	High Skilled
0%	6625	3861	9953	9245	16934
5%	3774	1495	6248	6172	12350
10%	923	-870	2542	3098	7766
15%	-1928	-3235	-1163	24	3182
20%	-4778	-5601	-4868	-3050	-1402
25%	-7629	-7966	-8574	-6124	-5985
30%	-10480	-10331	-12279	-9197	-10569
35%	-13331	-12696	-15984	-12271	-15153
40%	-16182	-15062	-19690	-15345	-19737

- *MWTP for Share of migrants varies between levels of share of migrants*
- *Valuation pattern appears to be origin based (in low shares).*


MWTP for an additional share of migrants in ZH municipalities (by groups of skill and origin)
MWTP (EUR)
20000
10000
0
-10000
-20000
-30000
-40000
0%
5%
10%
15%
20%
25%
30%
35%
40%
45%
50%
Share of migrants
Native_Low_ skill
Native skill
Mig Low_skill
Mig Skill

Discussion and conclusion

- Consumer amenities are important for locations' attractiveness.
- Preferences of skilled migrants are similar to those of skilled natives.
- Share of migrants – decreasing MWTP
- Policy implications

To be included in the research

- Dutch CBS data to replace WoON survey
  - better identification of households' characteristics
  - Larger study area
- Spatial extensions
- Counterfactual simulations

Questions

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