CENTRE OF EXCELLENCE IN ENERGY EFFICIENCY

IMO INFOTEHNOLOOGILINE MOBIILSUSOBSERVATOORIUM

Digital transition and new forms of spatial inequality and segregation

Keynote talk

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Professor of Urban and Population Geography
University of Tartu



Segregation Research Network Conference 2026
12-13 October 2026, Uppsala

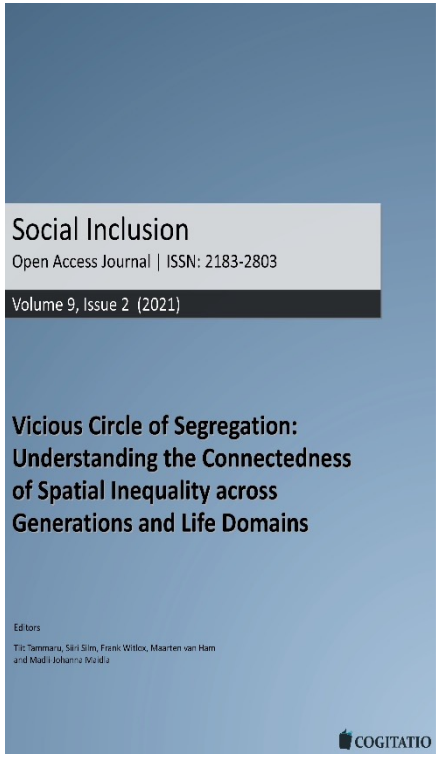
This research was supported by the Estonian Ministry of Education and Research through the Centre of Excellence in Energy Efficiency (ENER), grant TK230

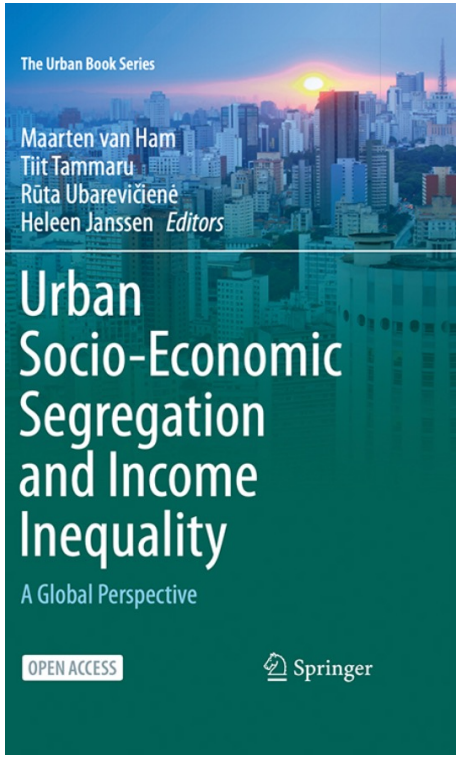
Recent collaborative work

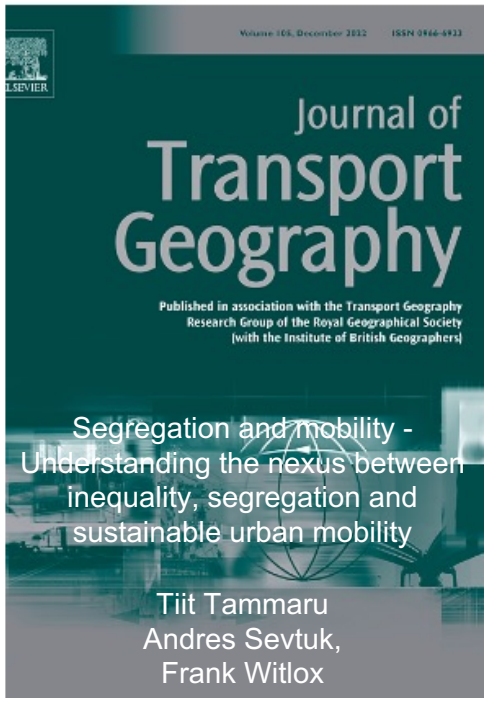


segregationlab.com

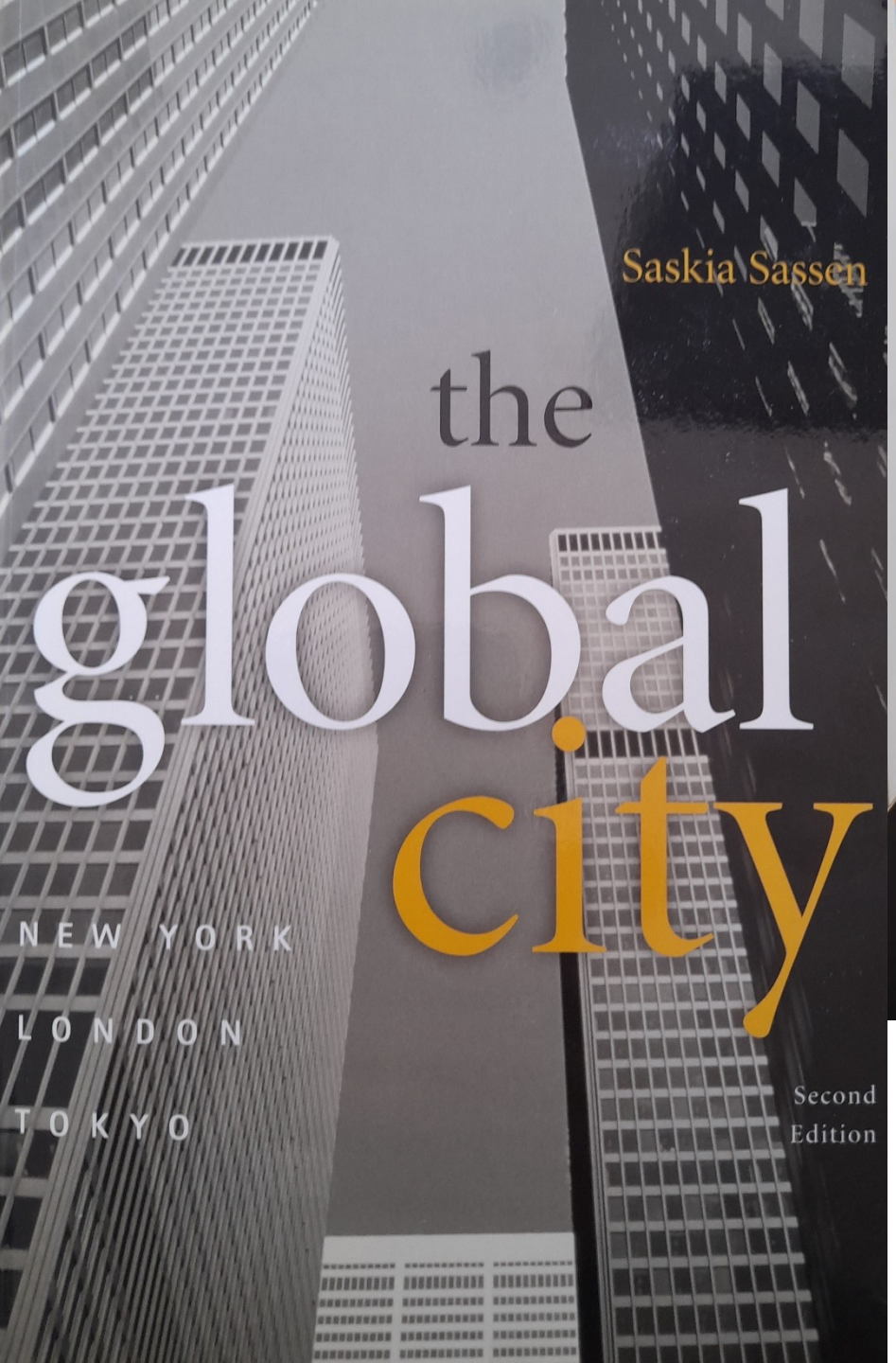
segregationcircles.eu







Points of departure





social polarisation thesis



social polarisation

vs

professionalisation

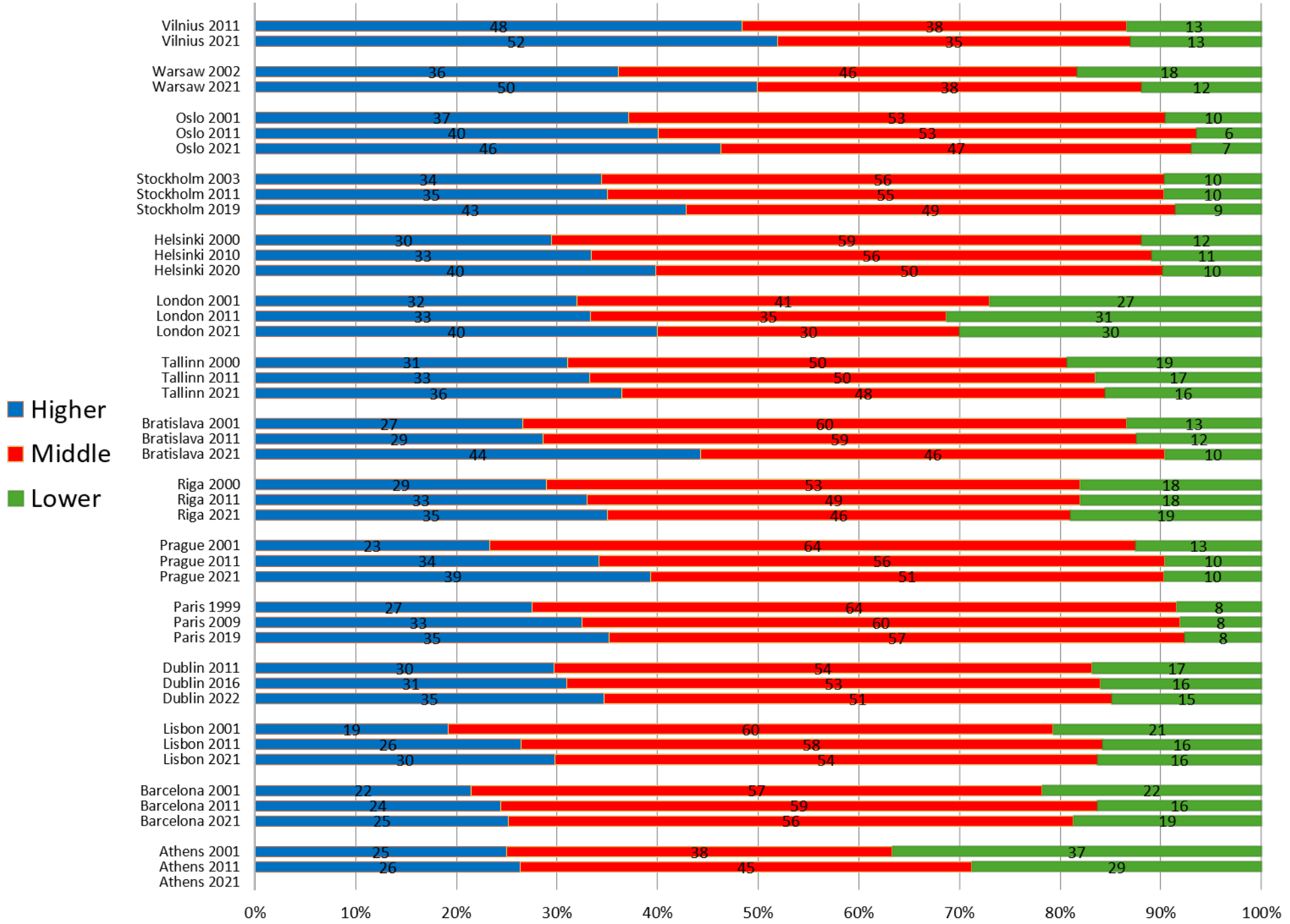
debate

Saskia Sassen

Chris Hamnett



Changes in the occupational structure

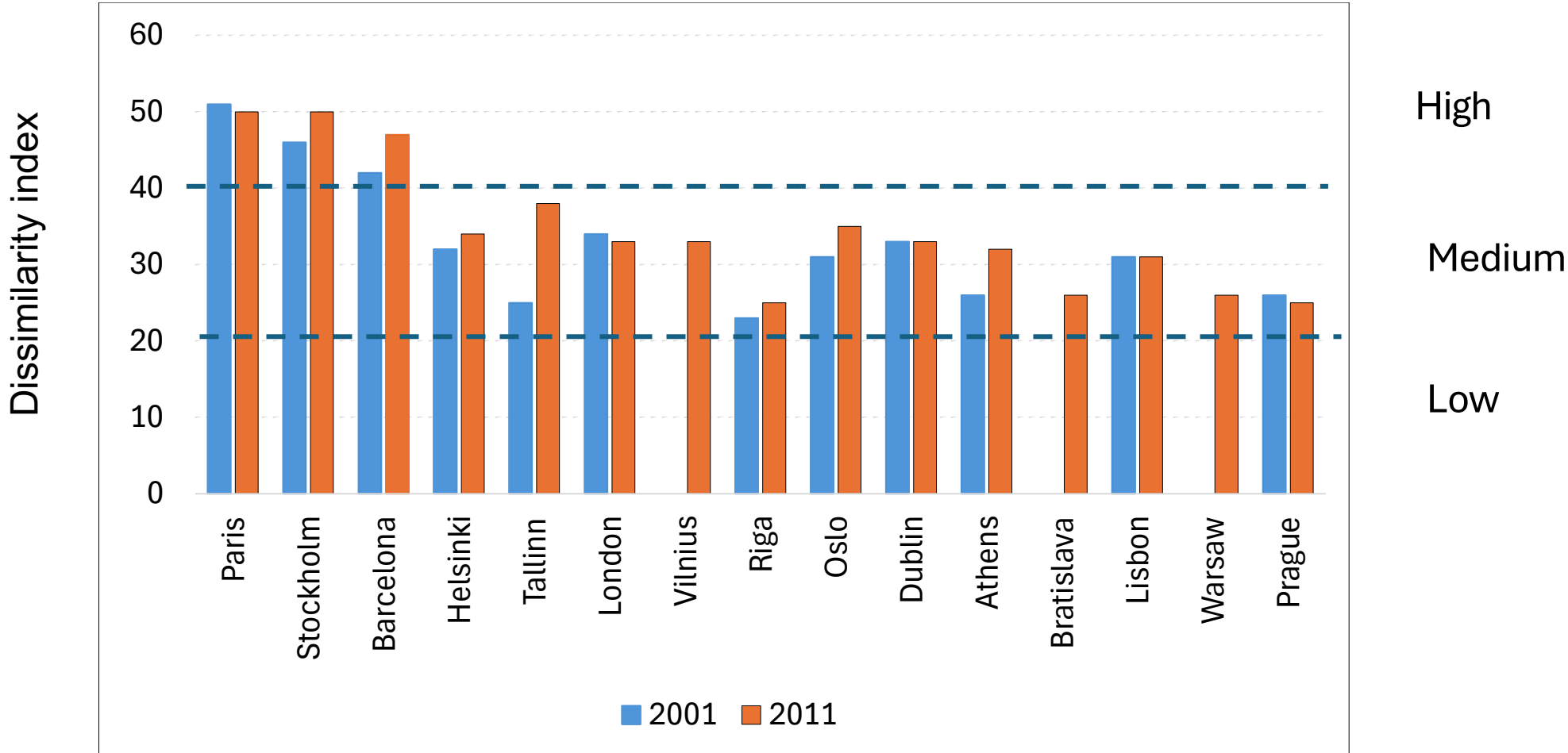




Tech sector contributes to professionalisation

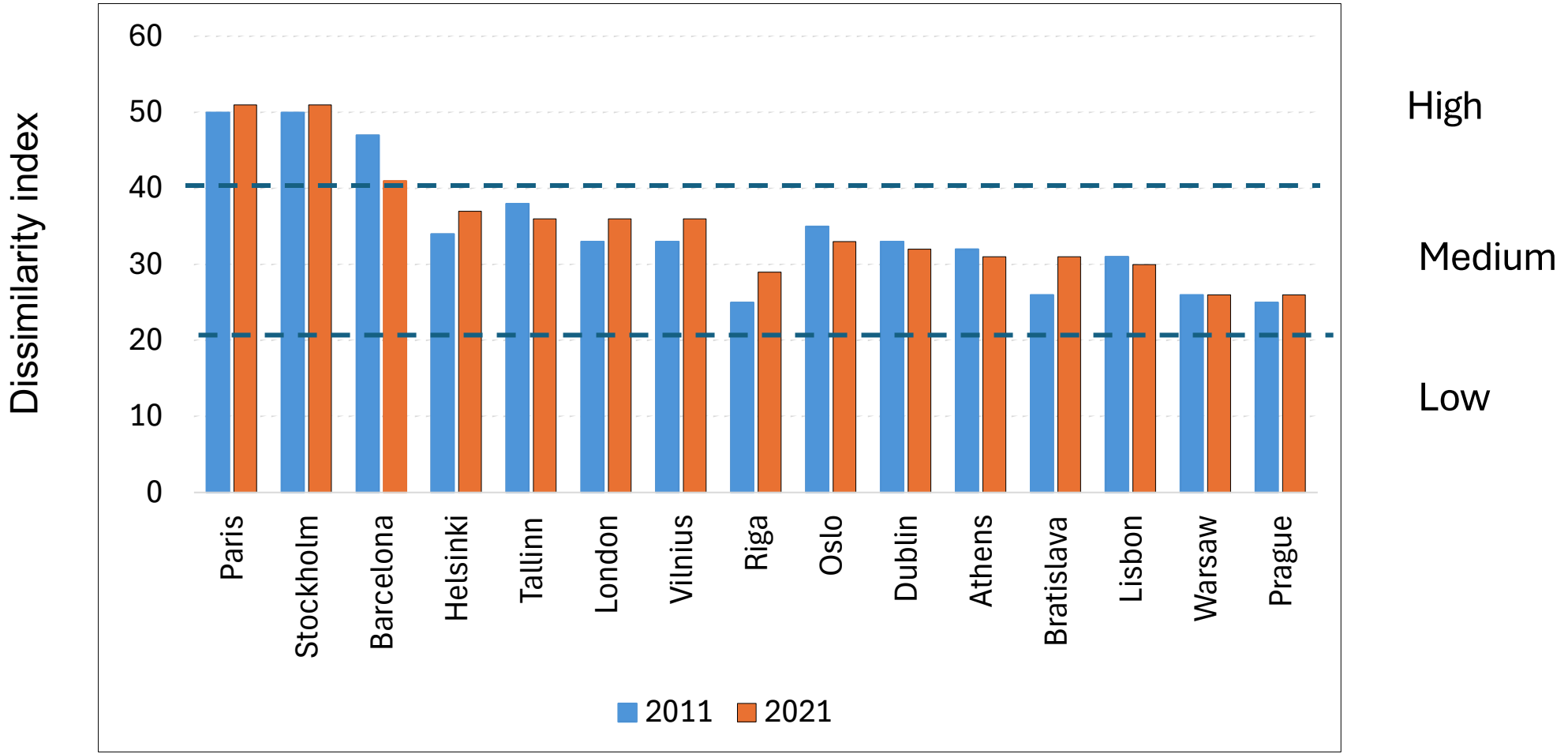
Changes in residential segregation, 2001 and 2011

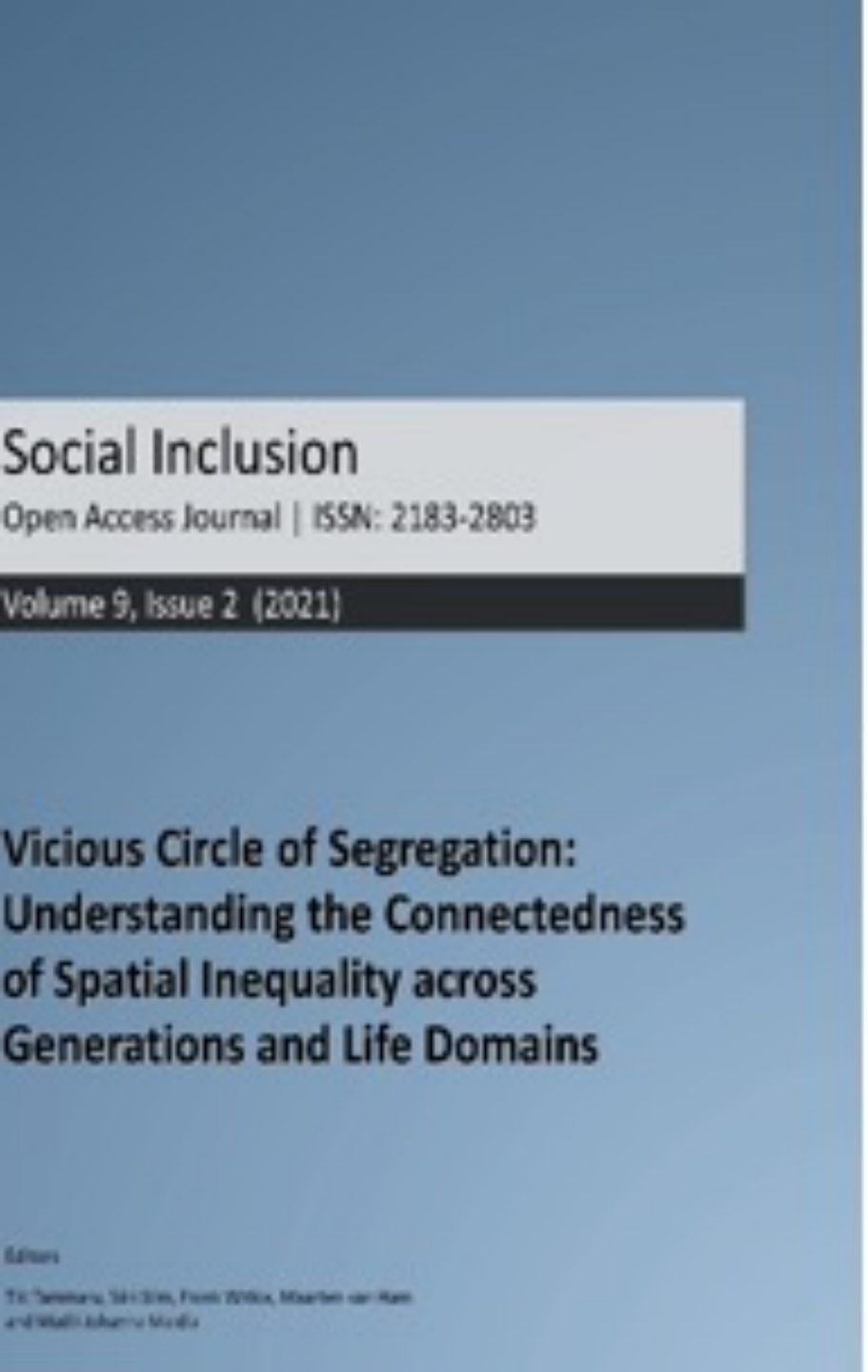
Higher *vs* lower occupational groups



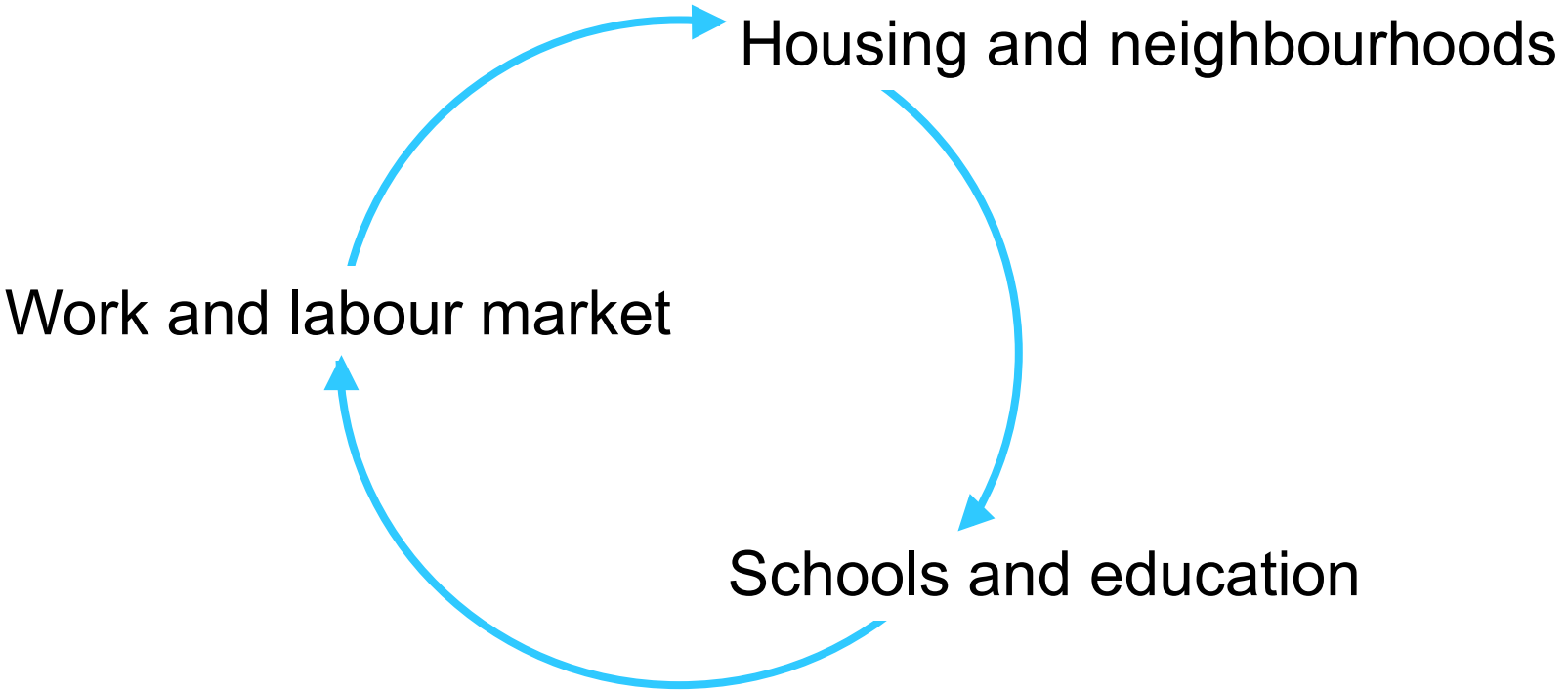
Changes in residential segregation, 2011 and 2021

Higher *vs* lower occupational groups





Vicious circle of segregation framework



How does digital transition reshape *levels* and *geographies* of residential segregation?

How does digital transition reshape *levels* and *geographies* of residential segregation?

Harvard Joint Centre for Housing Studies:
Working even one or two days from home would have an important effect on housing demand

Groups in focus

- ✓ **Tech workers:** professionals in the IT sector, driving and benefitting from digital transition
- ✓ **Remote workers:** people who can potentially telework, thus benefitting from new work arrangements

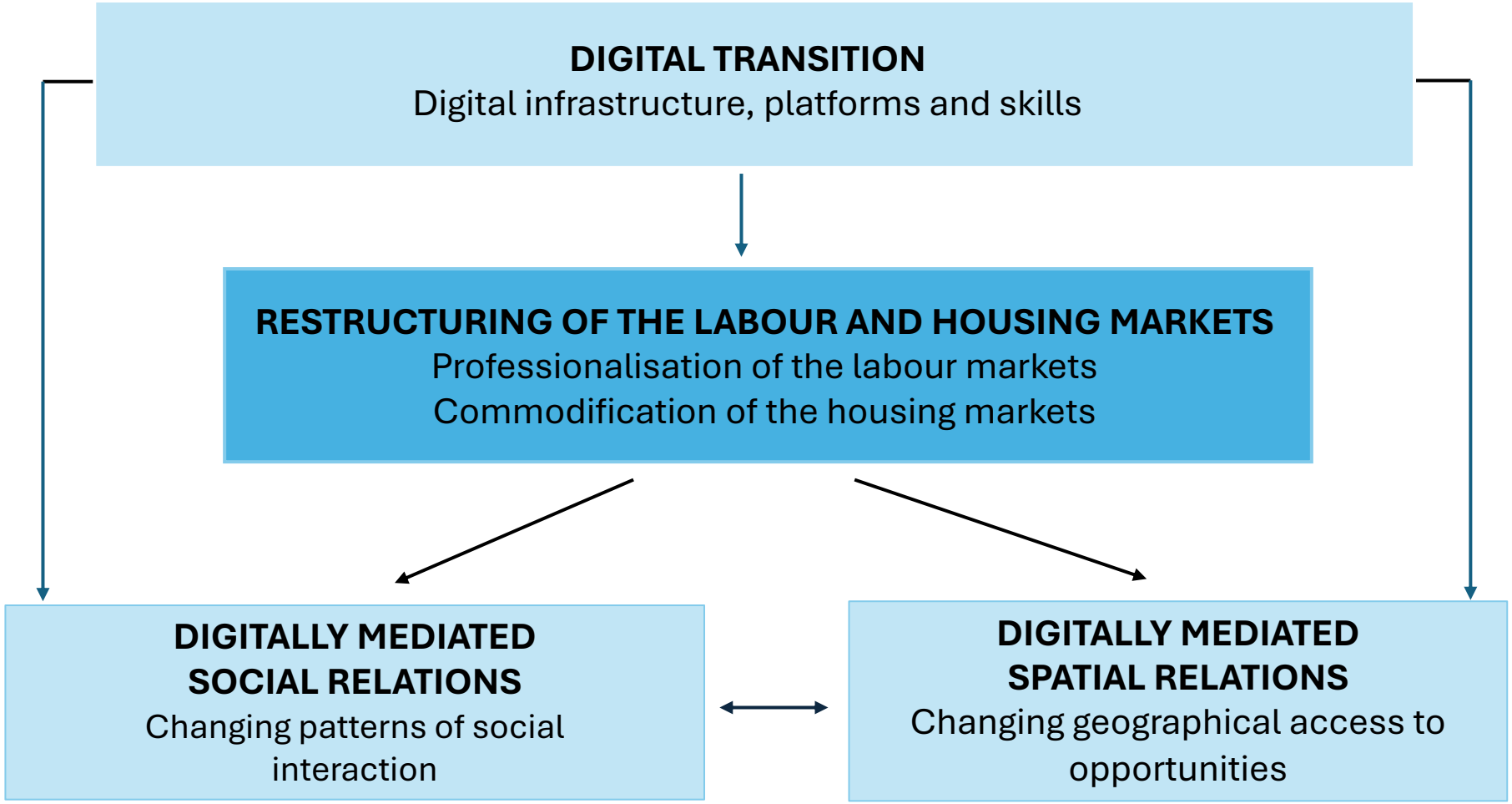
From place-bound to digitally mediated societies

RESTRUCTURING OF THE LABOUR AND HOUSING MARKETS

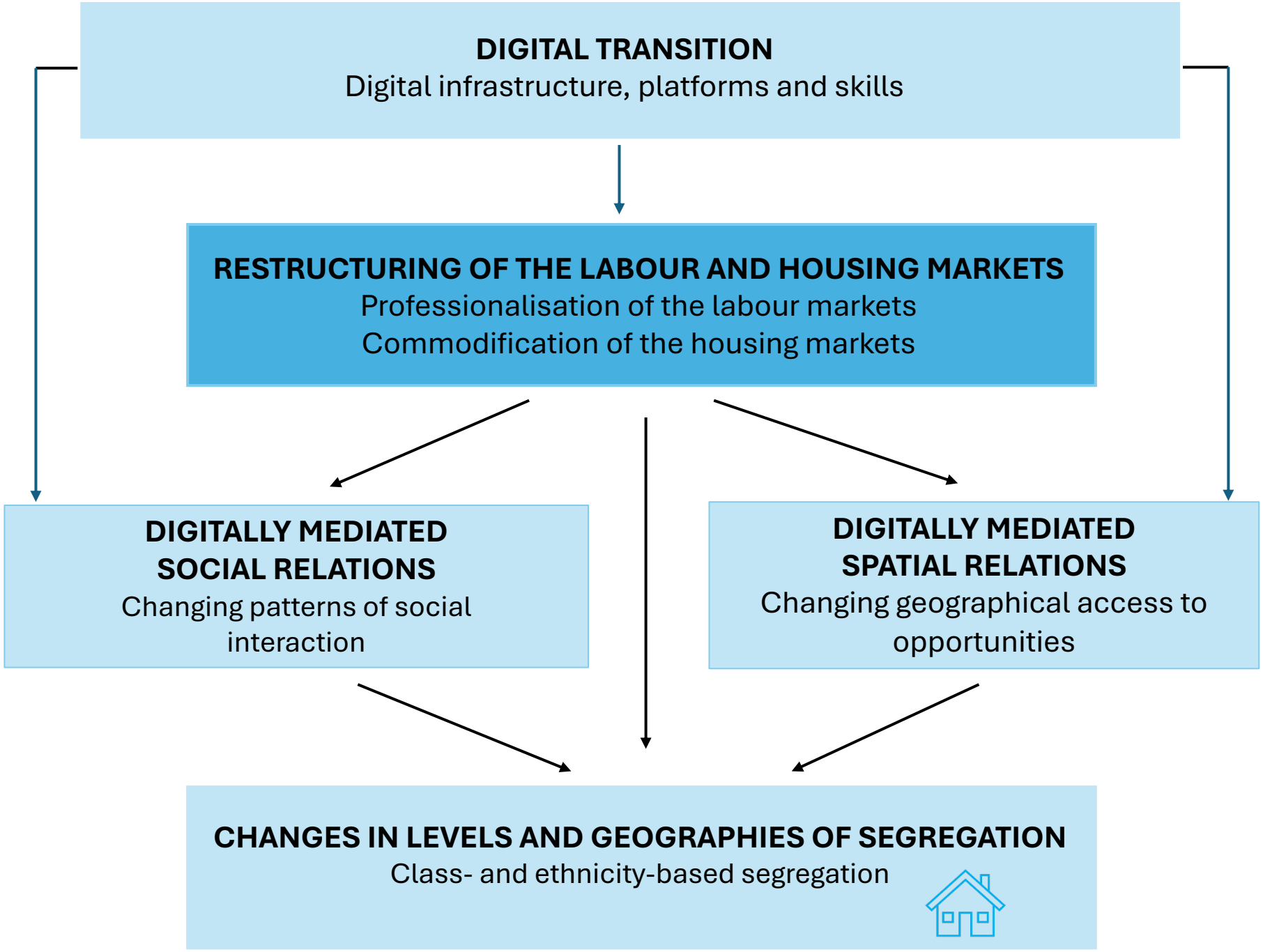
Professionalisation of the labour markets

Commodification of the housing markets

From place-bound to digitally mediated societies



From place-bound to digitally mediated societies



Changing role of urban housing under digital transition

- ✓ Home: family life, identity and status
- ✓ Wealth: who builds wealth through housing costs
- ✓ **Sorting:** who gets to live where
- ✓ **Workplace:** space to work
- ✓ **Anchor:** access to opportunities



High-end housing neighbourhood

Affordable housing neighbourhood



Silm, S, Tominga, A, Saidla, K, Poom, A, Tammaru, T 2024. Socio-economic and residential differences in urban modality styles based on a long-term smartphone experiment. *Journal of Transport Geography* 115, 103810

Residential segregation of minority tech workers

From place-bound to digitally mediated societies

nature cities

Article | Open access | Published: 03 April 2026

The role of tech workers in ethnicity- and class-based urban segregation

Jānis Zālīte, Kadi Kalm, Kadri Leetmaa & Tiit Tammaru

Nature Cities **3**, 371–379 (2026) | Cite this article

Save article

5162 Accesses | **1** Citations | **11** Altmetric | Metrics

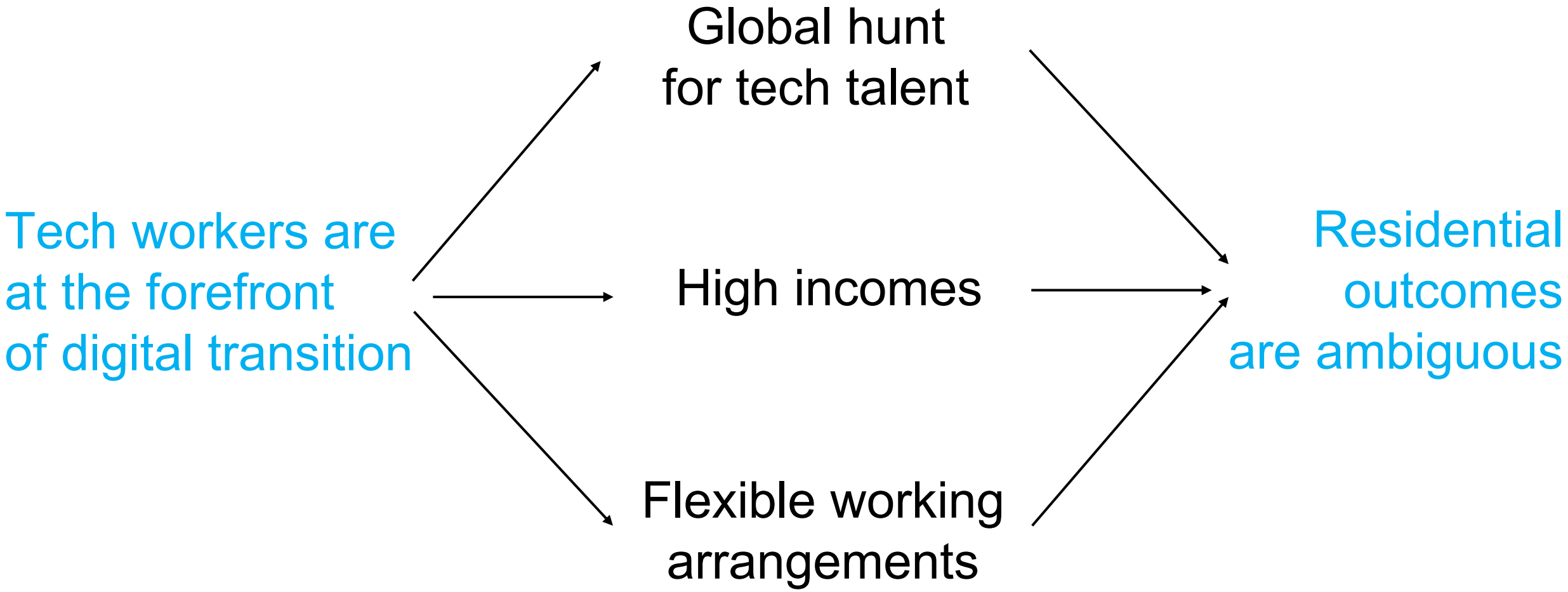
Abstract

Large cities are often segregated by both ethnicity and class, and these dimensions frequently overlap because minorities are over-represented in lower-paid occupations. We examine how these patterns shift during the course of digital-transition-driven professionalization by focusing on tech workers, a fast-growing professional group. Higher earnings and broad scope for remote work expand minority tech workers' residential options relative to other minorities facing tighter housing constraints. What remains unclear is whether their residential sorting is driven primarily by ethnicity or by class. Our empirical evidence comes from Tallinn, the capital of Estonia—a country known for its digital advancement. On the basis of population-wide register data, we find that the residential outcomes of minority tech workers align with class position, paralleled by the increasing spatial isolation of non-tech minorities as upward occupational mobility draws minority professionals out of lower-income co-ethnic areas. These results underscore the need to design urban policy for digitally transforming and professionalizing cities, with explicit attention to class-based segregation risks among minority communities who gain less from new opportunities.

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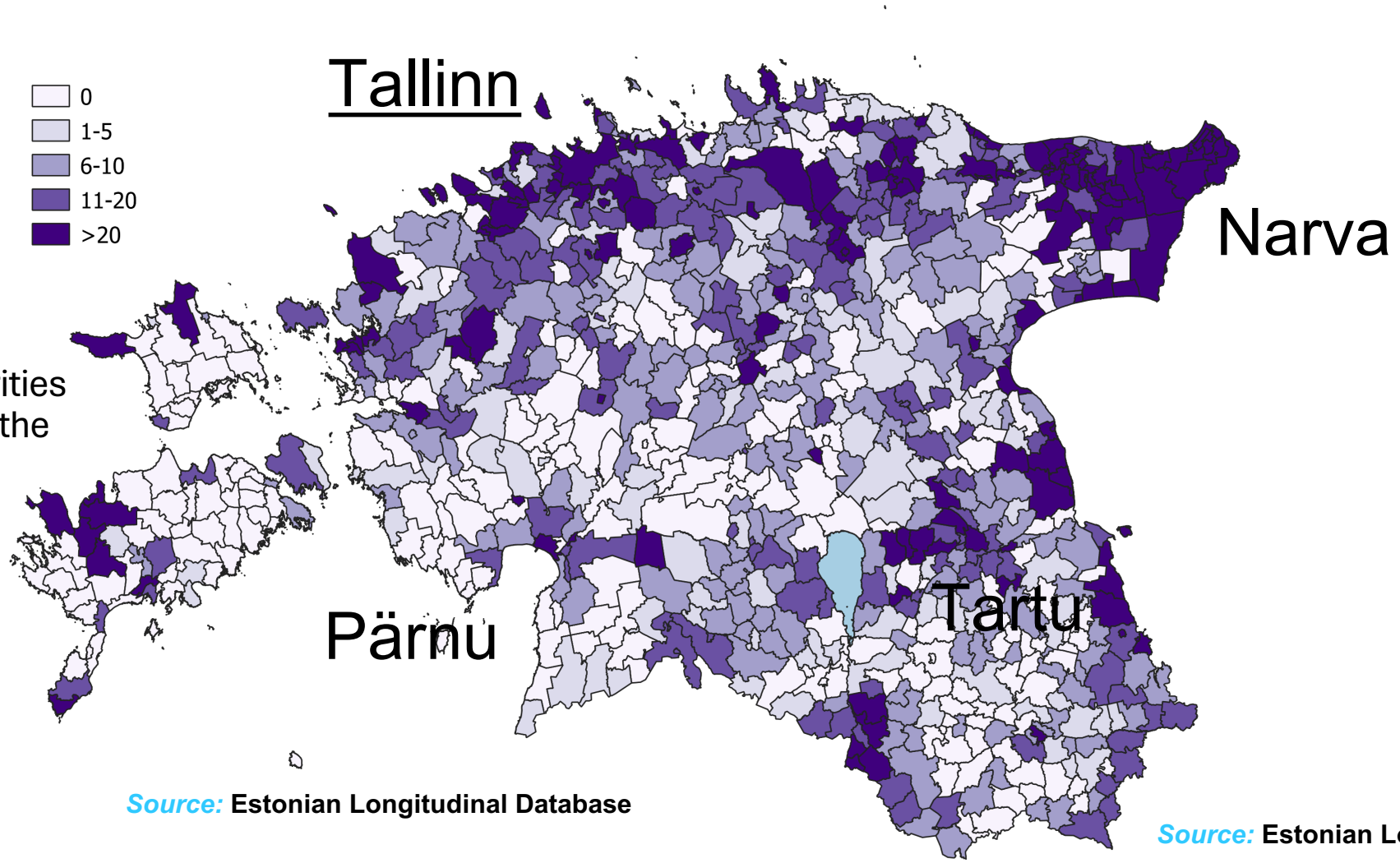
Sections | Figures | References

Abstract
Main
Results
Discussion
Conclusions
Methods
Data availability
References
Acknowledgements
Author information
Ethics declarations
Peer review
Additional information
Supplementary information
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About this article



To what extent are these outcomes ethnicity- or class-based?

Share of ethnic minorities in Estonia (%), 1989

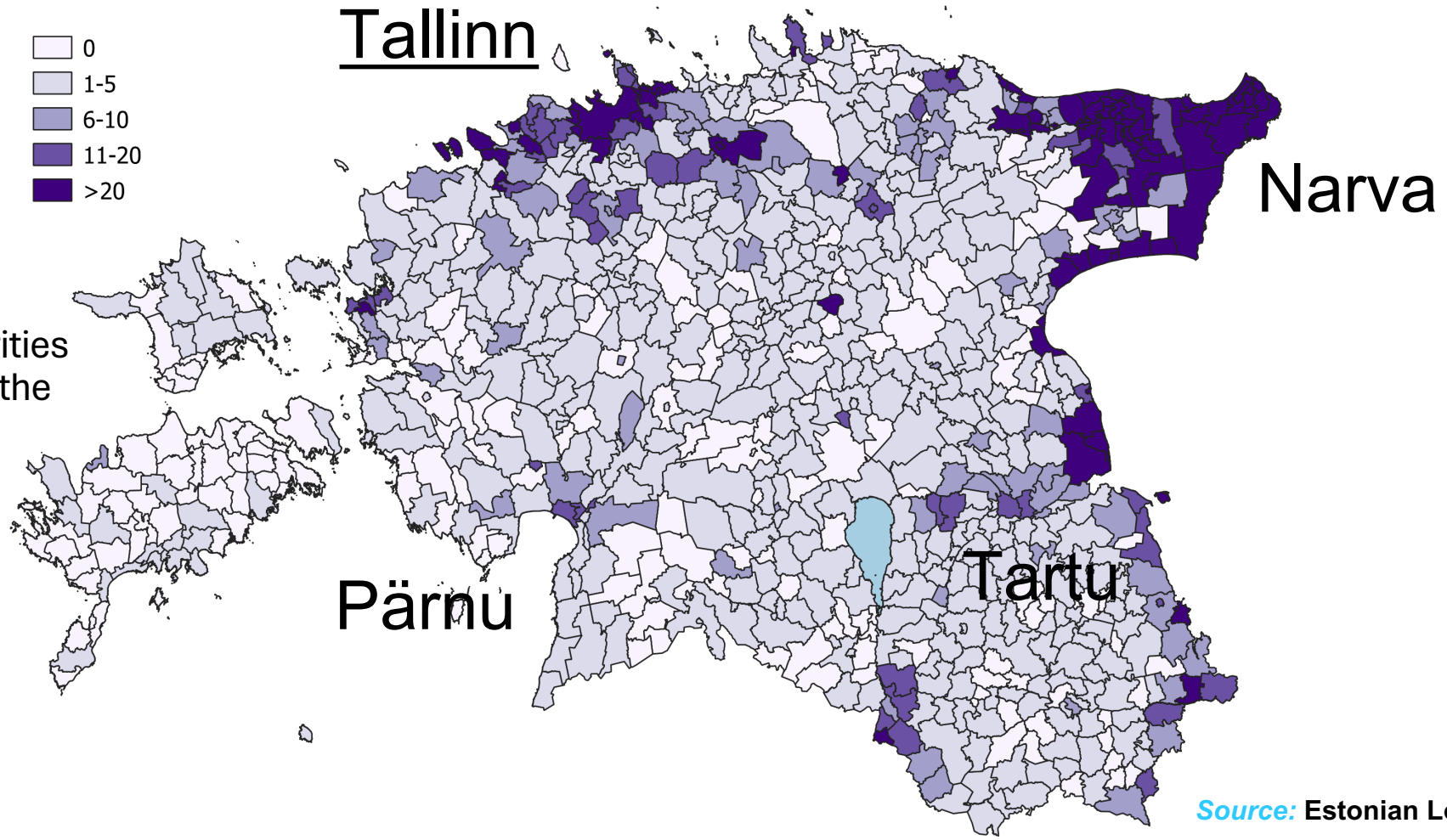


Nation-wide, minorities form almost 1/3 of the population

Source: **Estonian Longitudinal Database**

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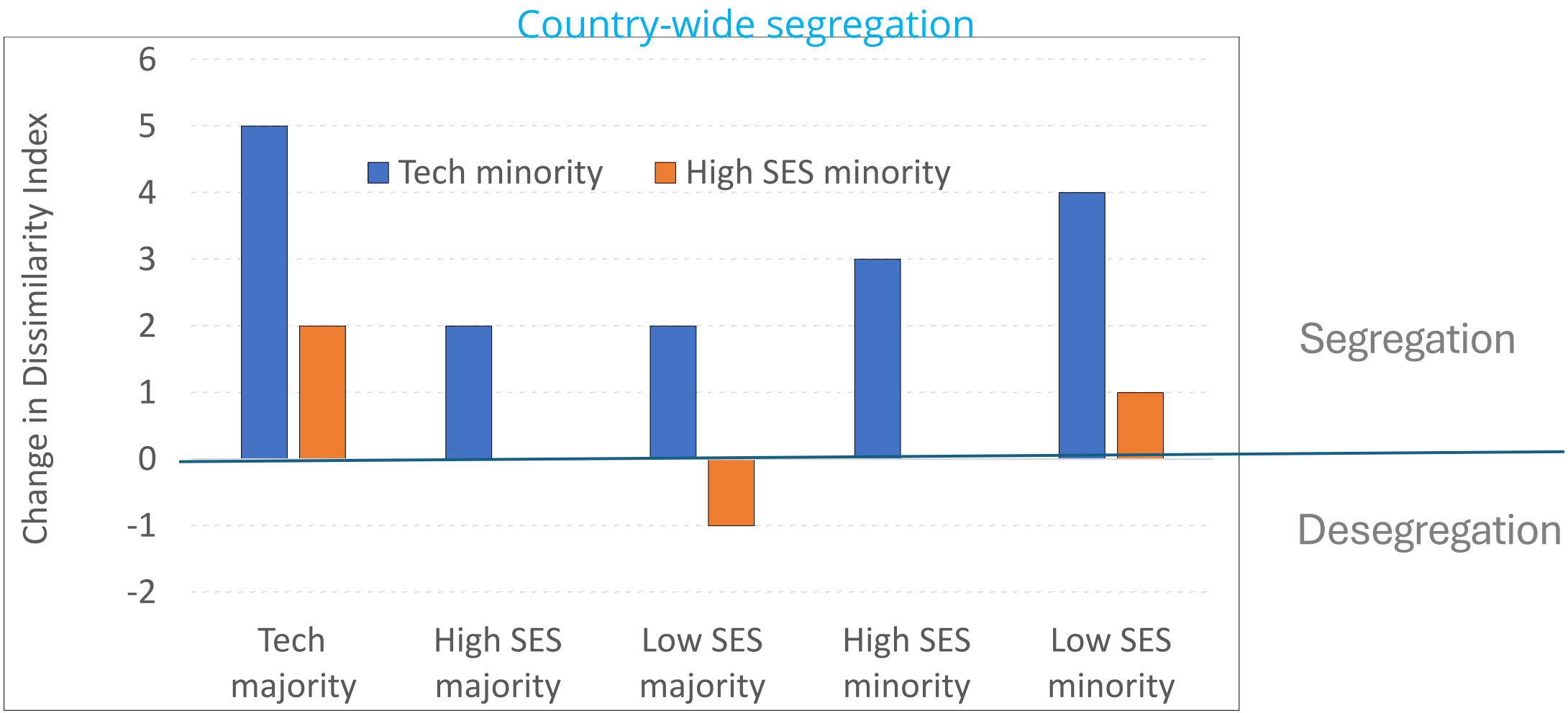
Share of ethnic minorities in Estonia (%), 2024



Nation-wide, minorities form almost 1/3 of the population

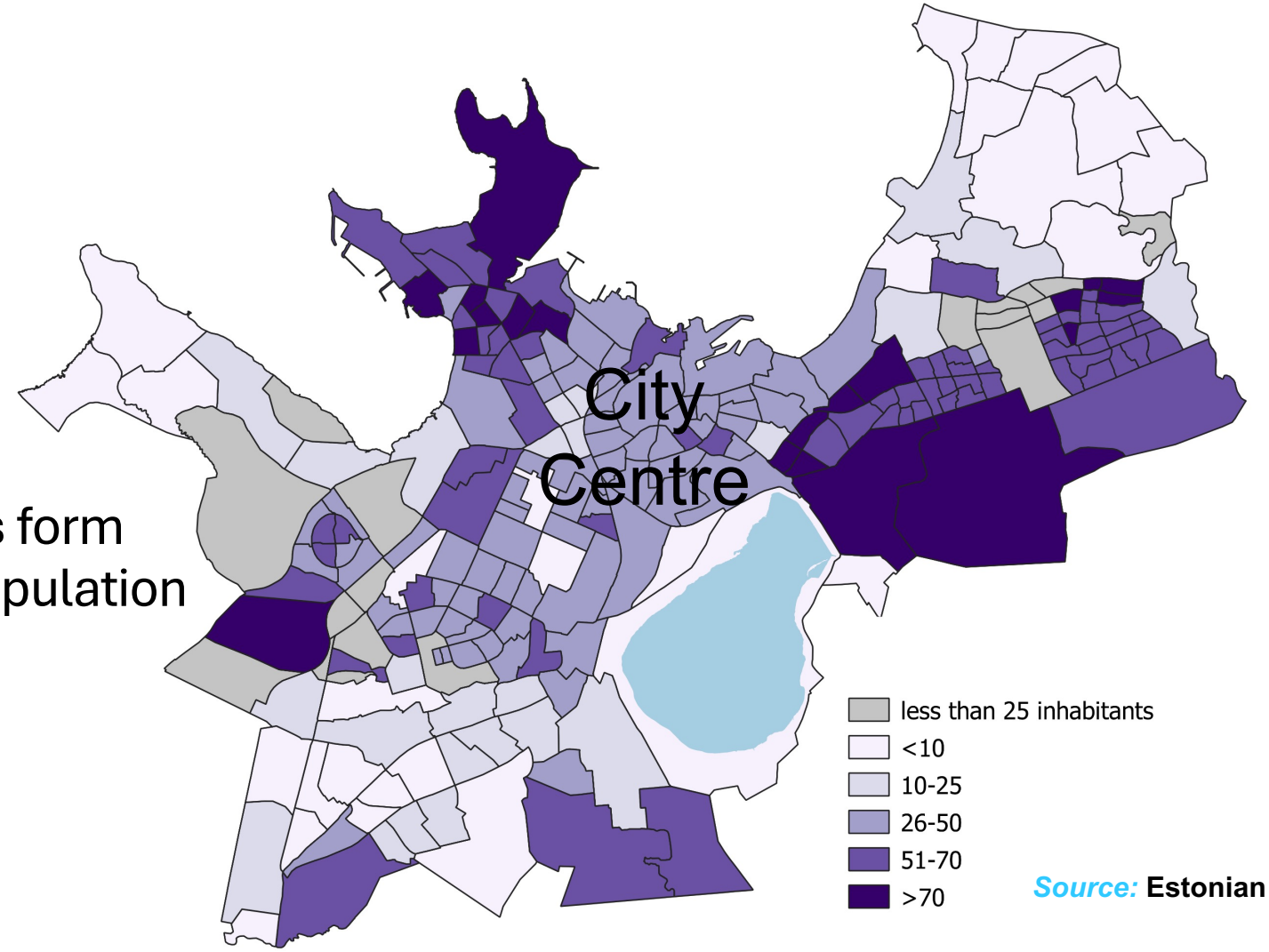
Source: **Estonian Longitudinal Database**

Changes in levels of segregation between 2011 and 2021



Share of ethnic minorities in Tallinn (%), 1989

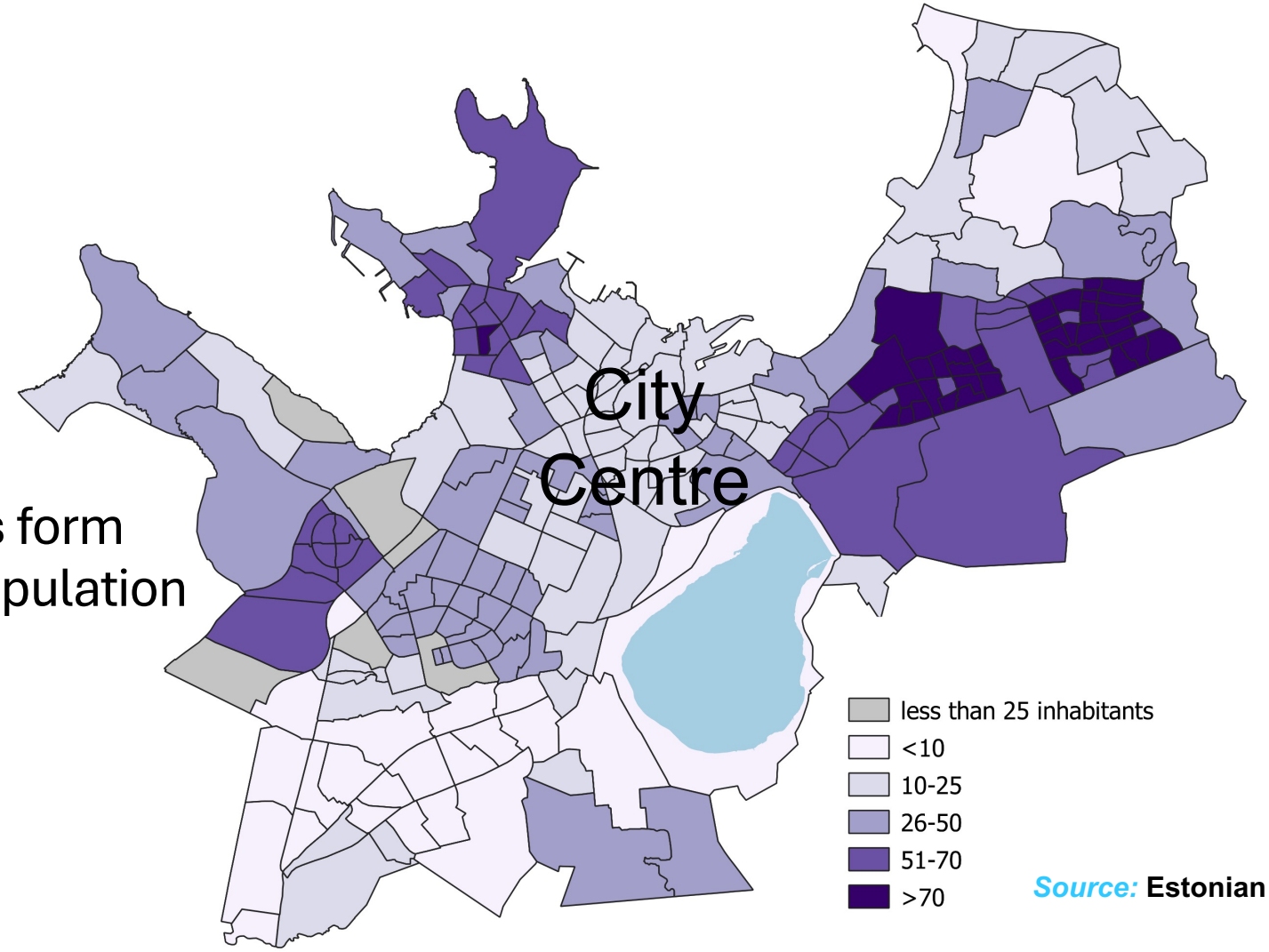
City-wide, minorities form almost half of the population



Source: **Estonian Longitudinal Database**

Share of ethnic minorities in Tallinn (%), 2024

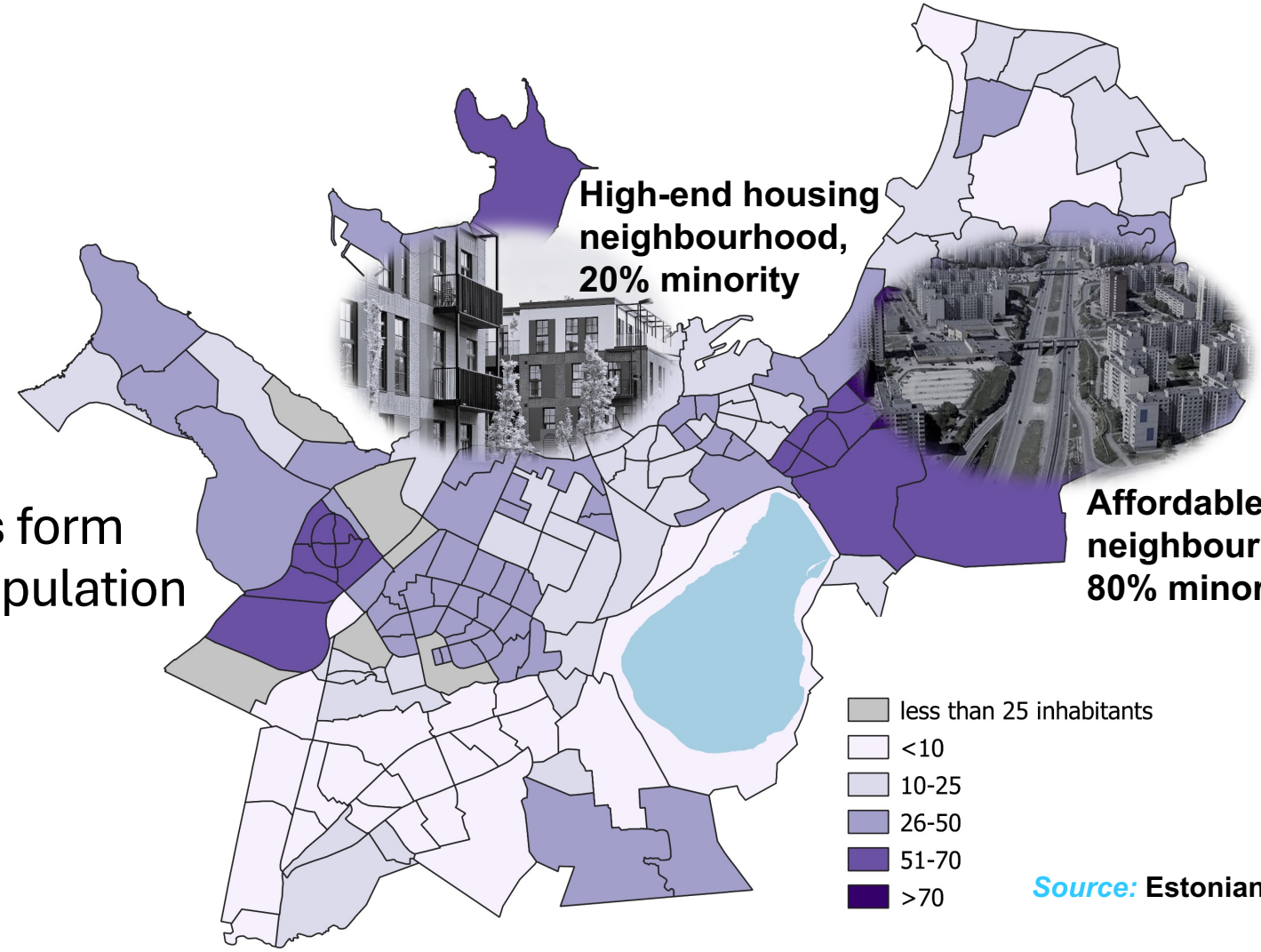
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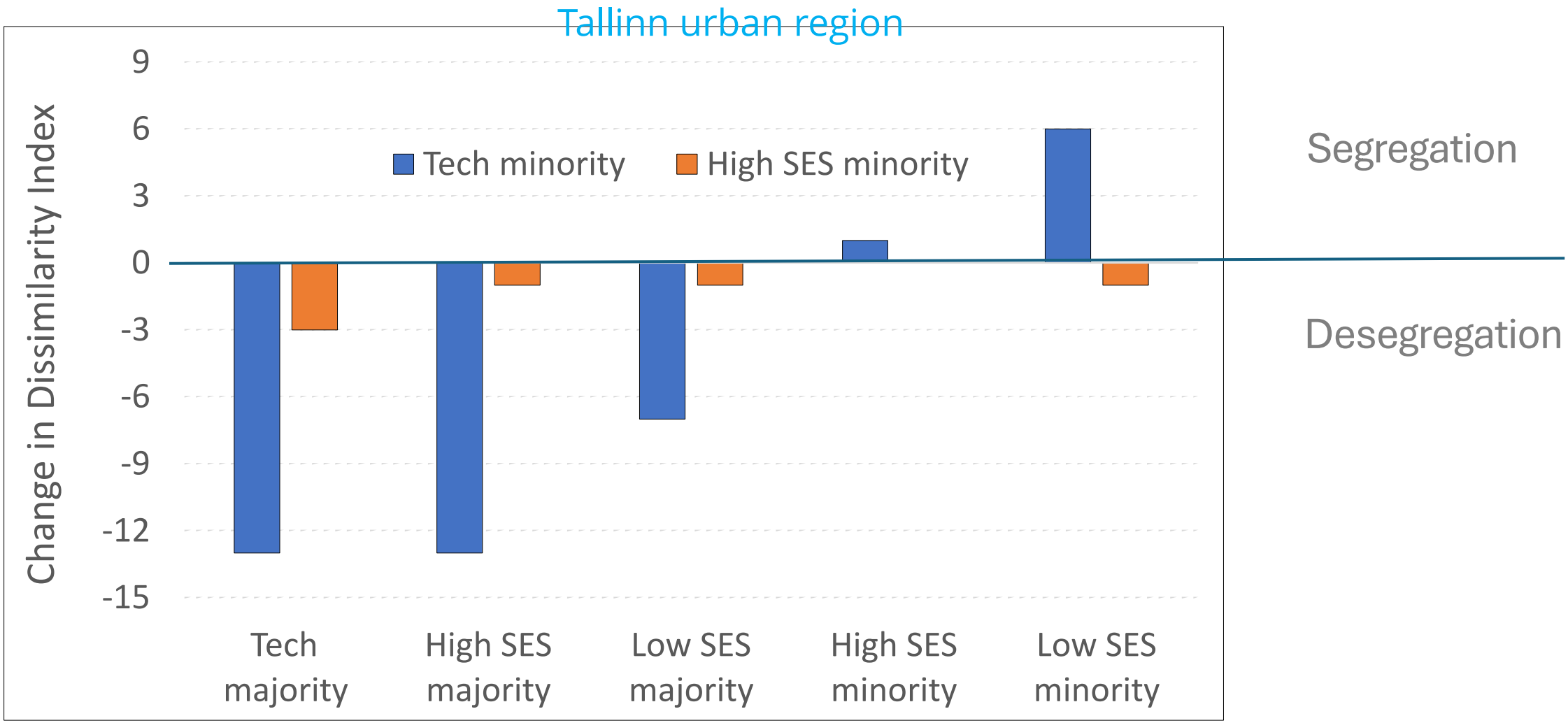
Share of ethnic minorities in Tallinn (%), 2024

City-wide, minorities form almost half of the population



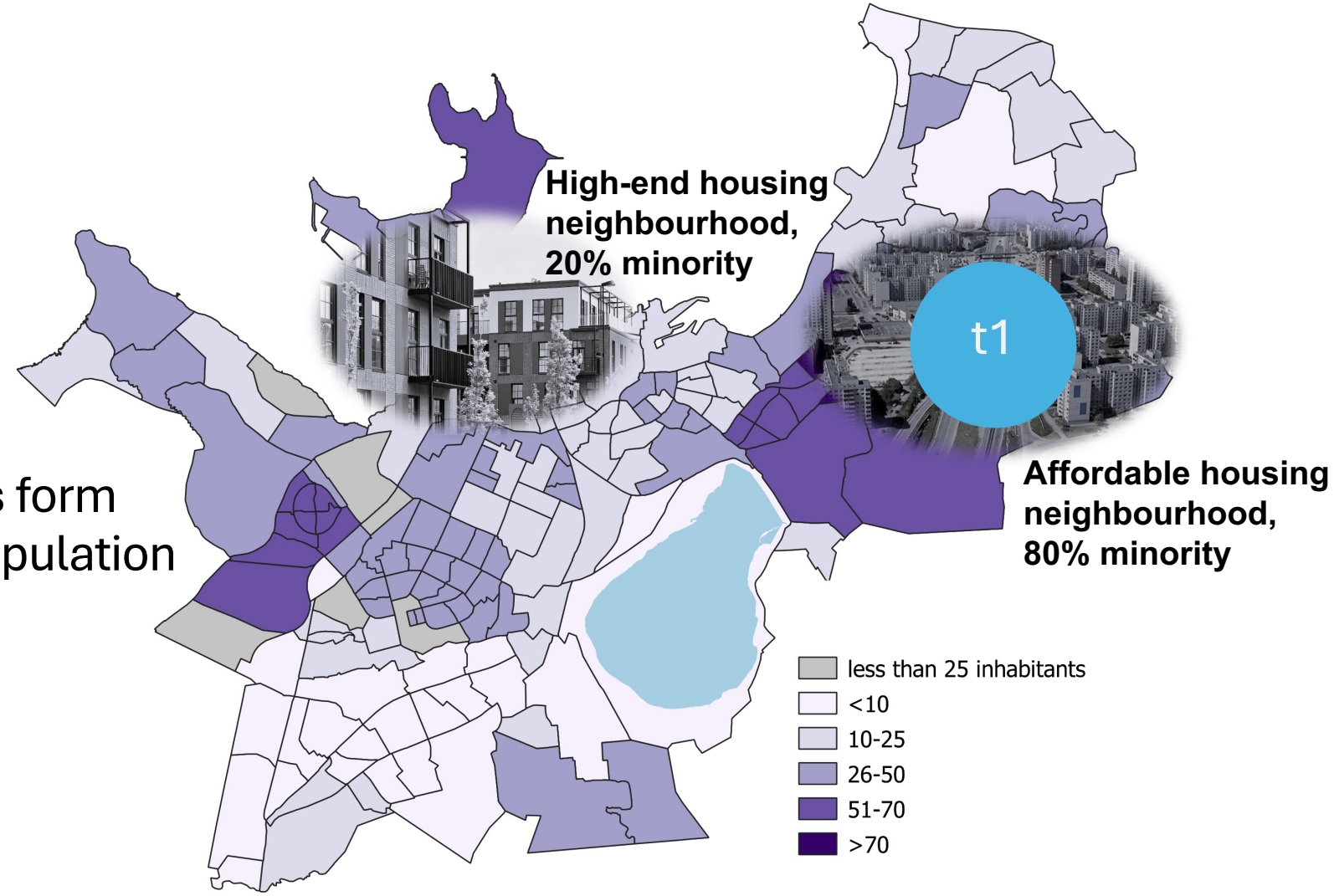
Source: **Estonian Longitudinal Database**

Changes in levels of segregation between 2011 and 2021



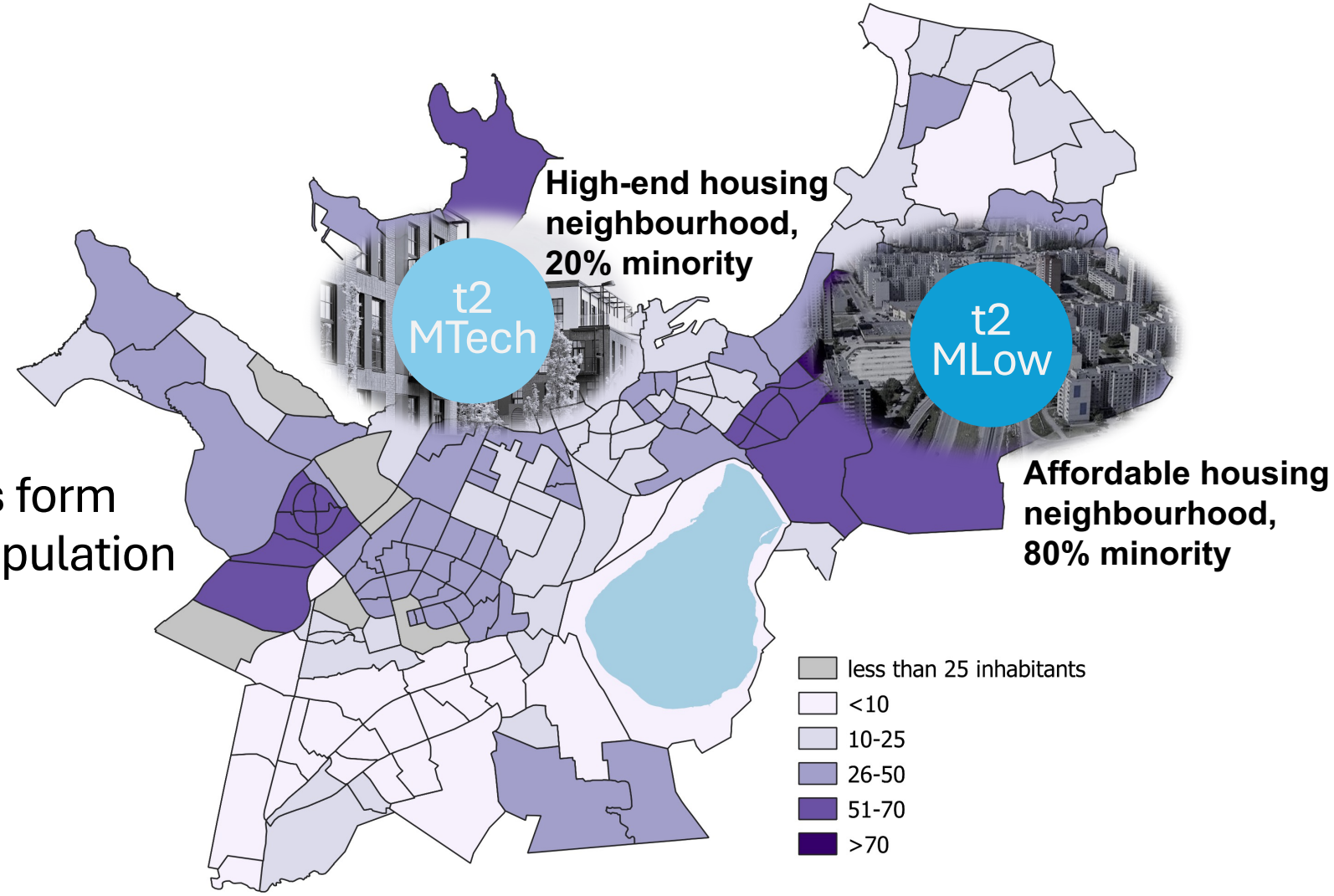
Changing geography of minority tech workers

City-wide, minorities form almost half of the population



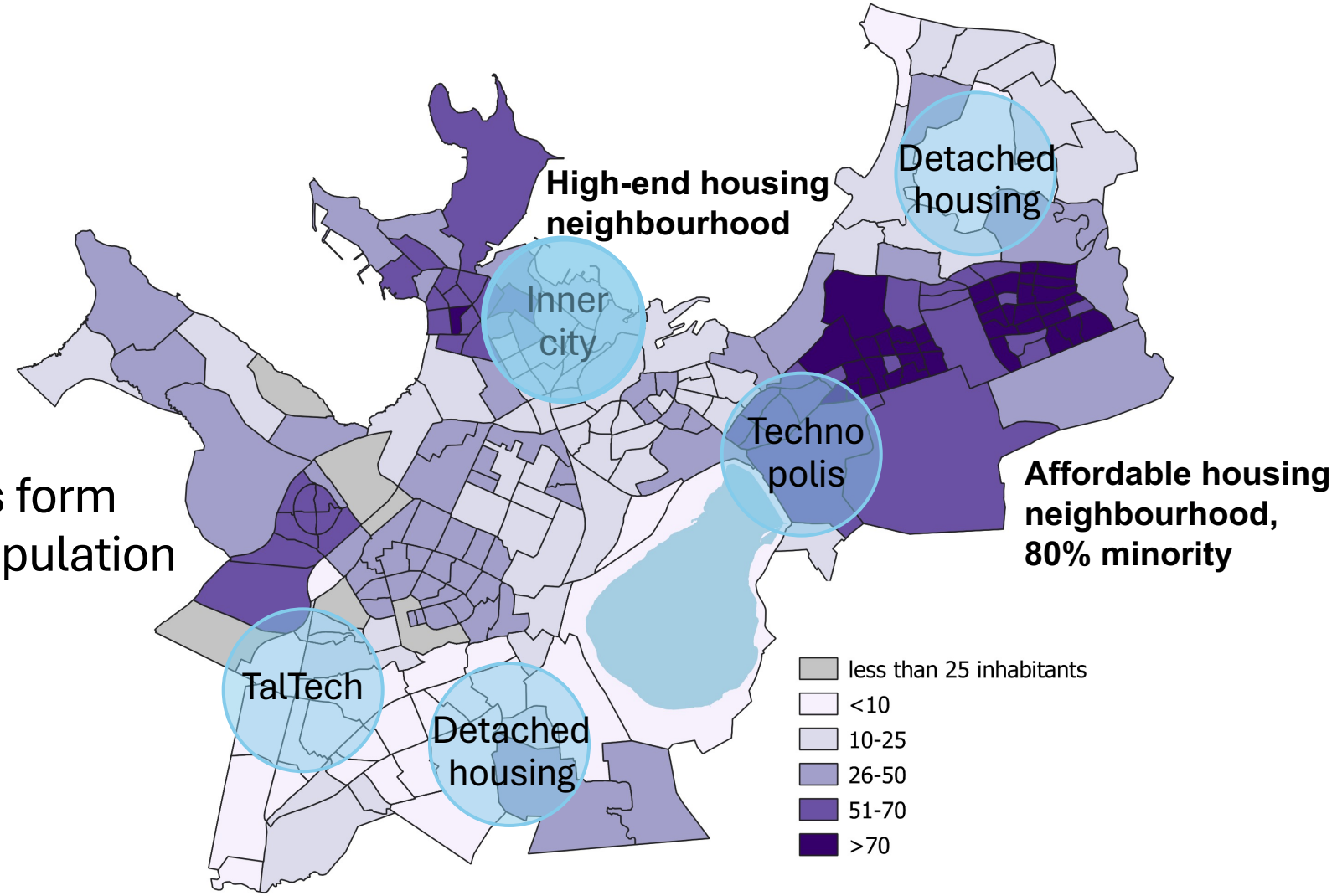
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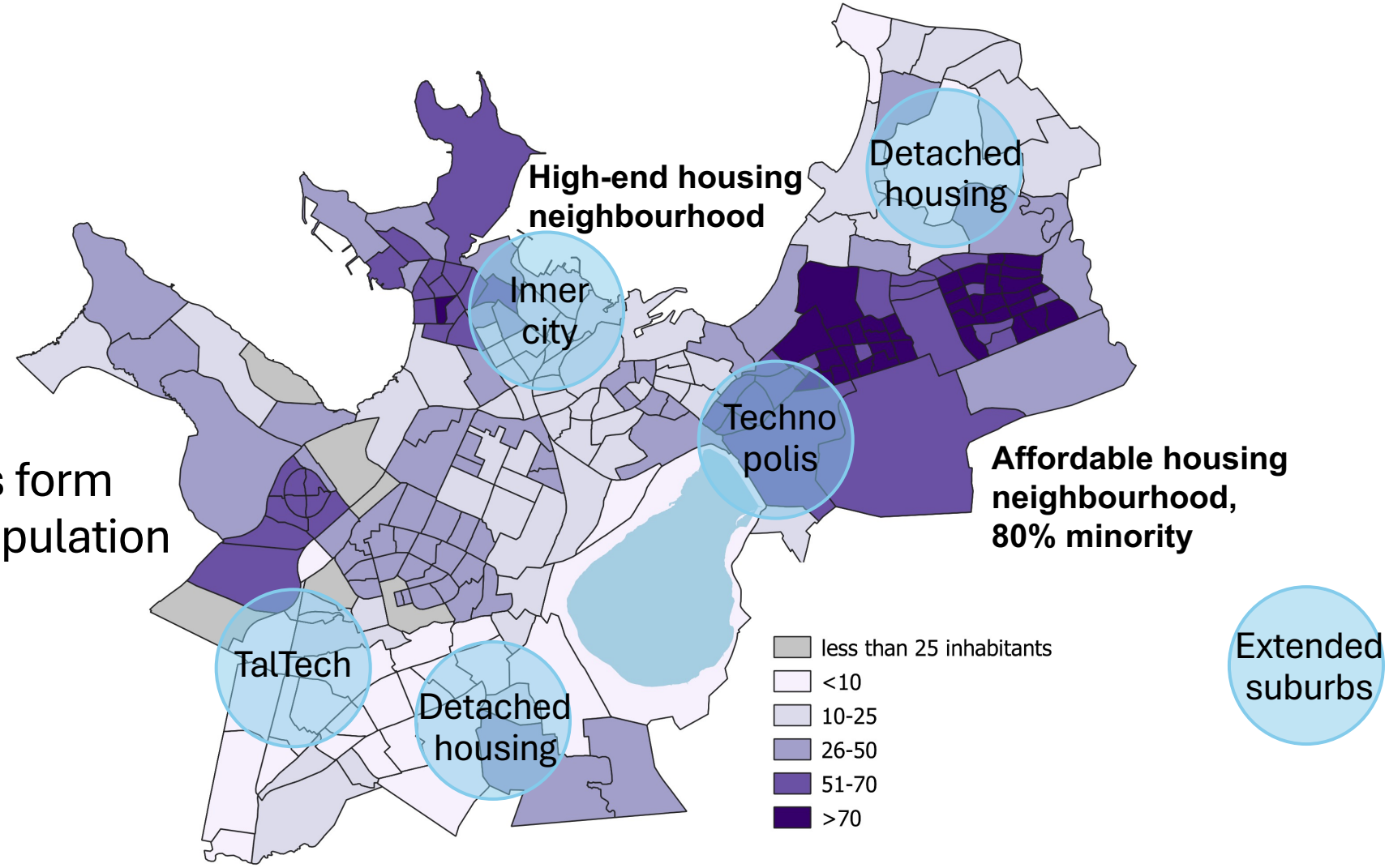
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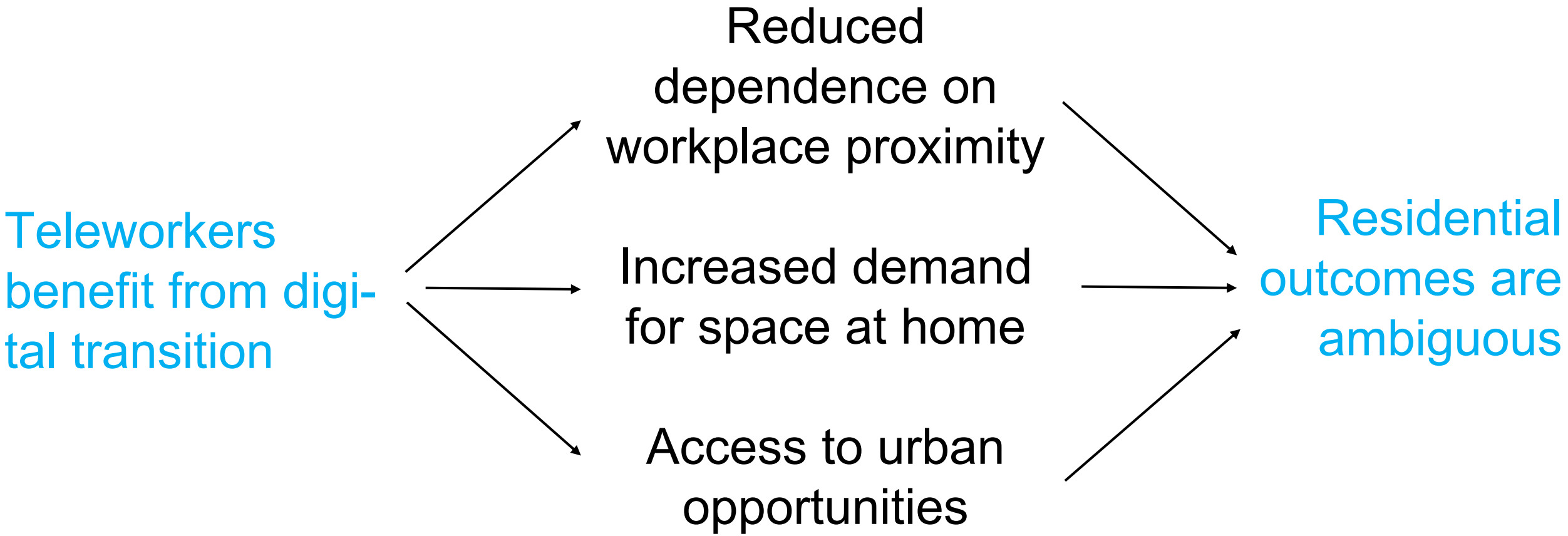
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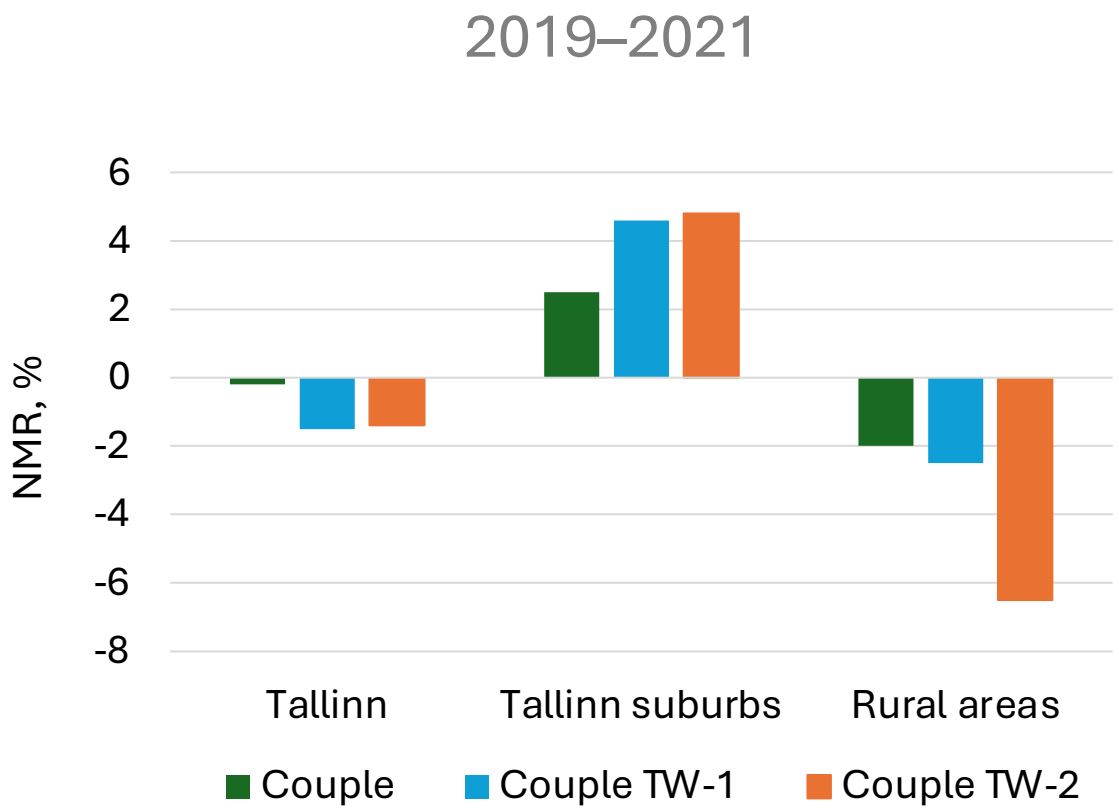
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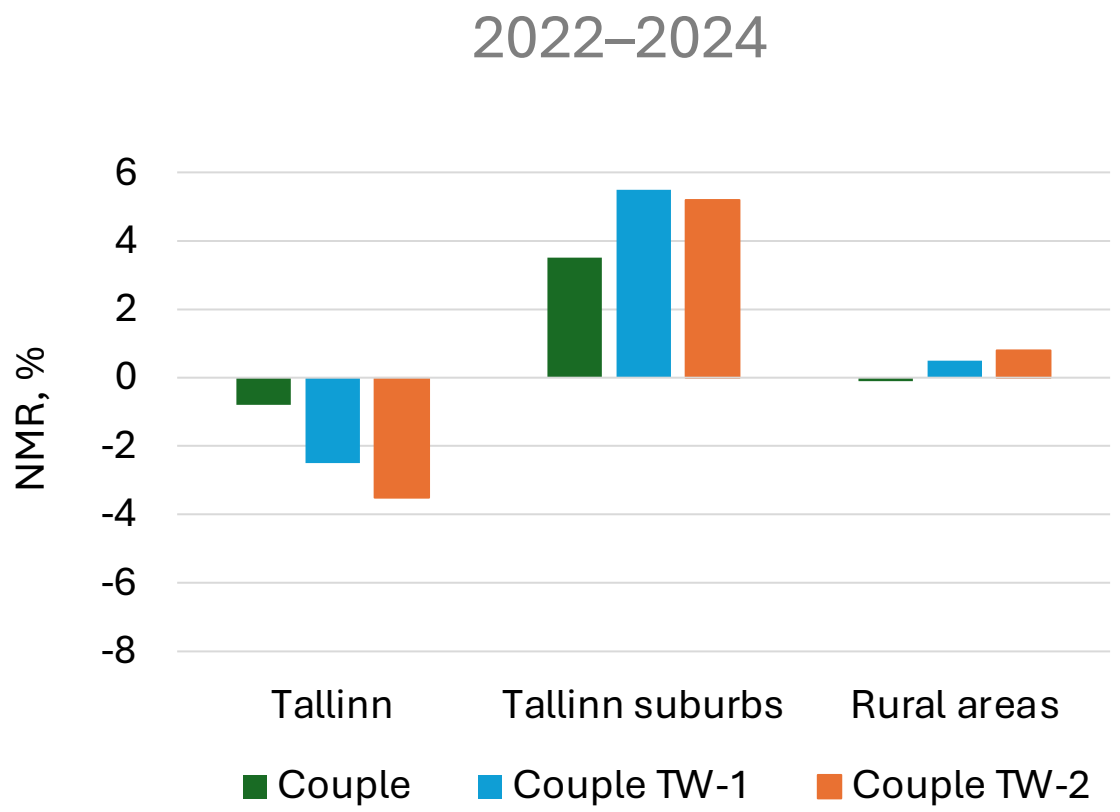




To what extent does telework encourage residential deconcentration?

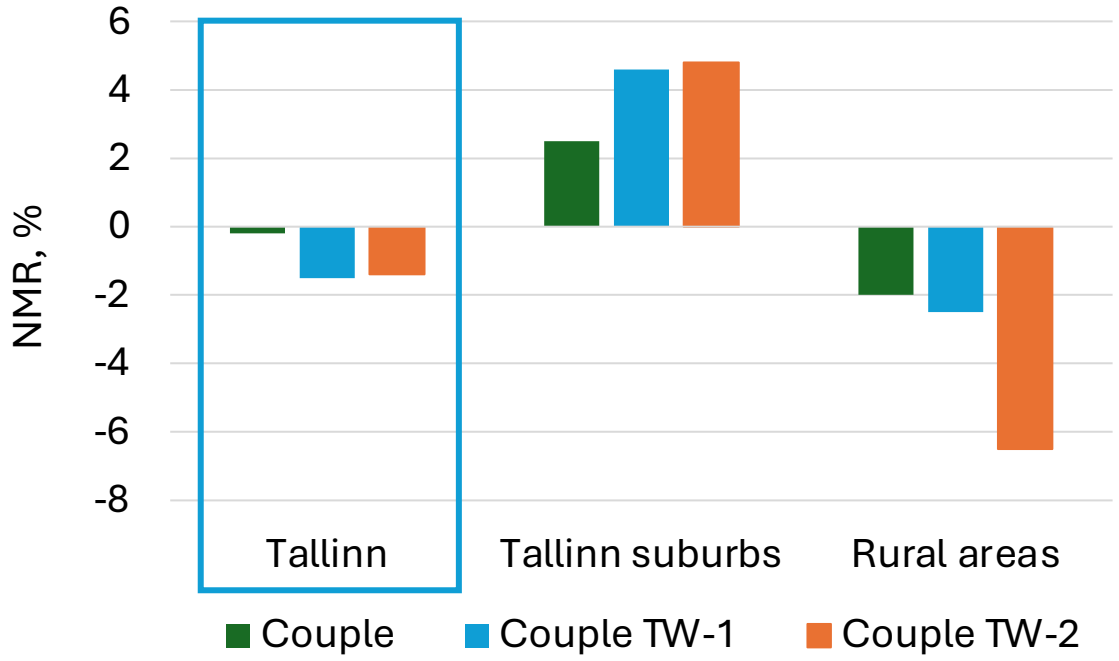
Migration of teleworkers and non-teleworkers



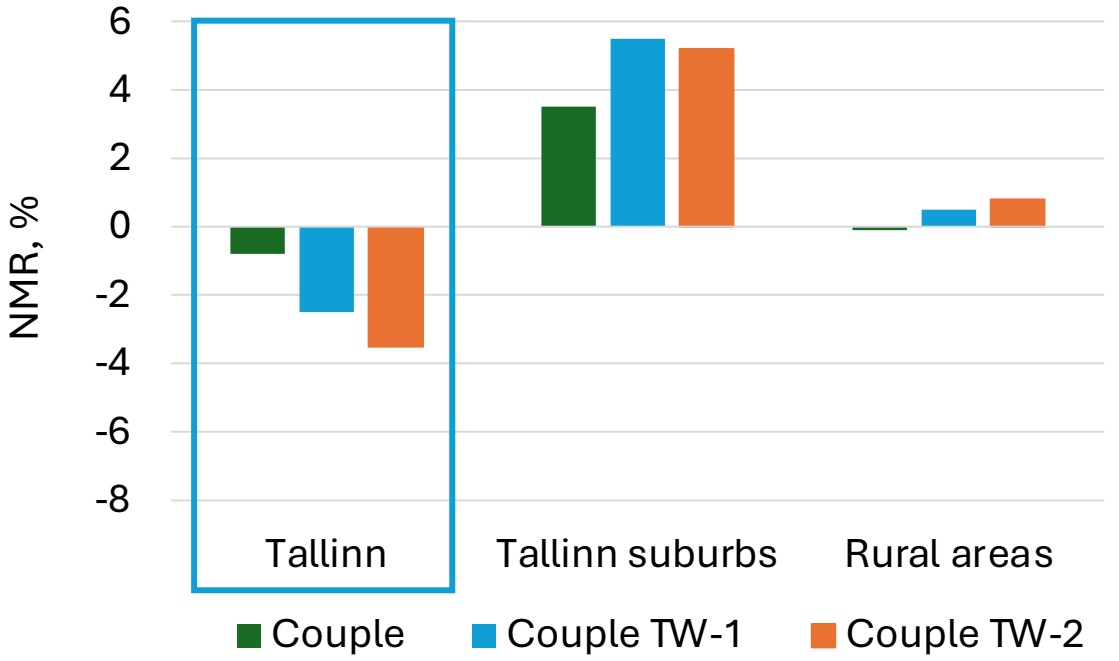


Migration of teleworkers and non-teleworkers

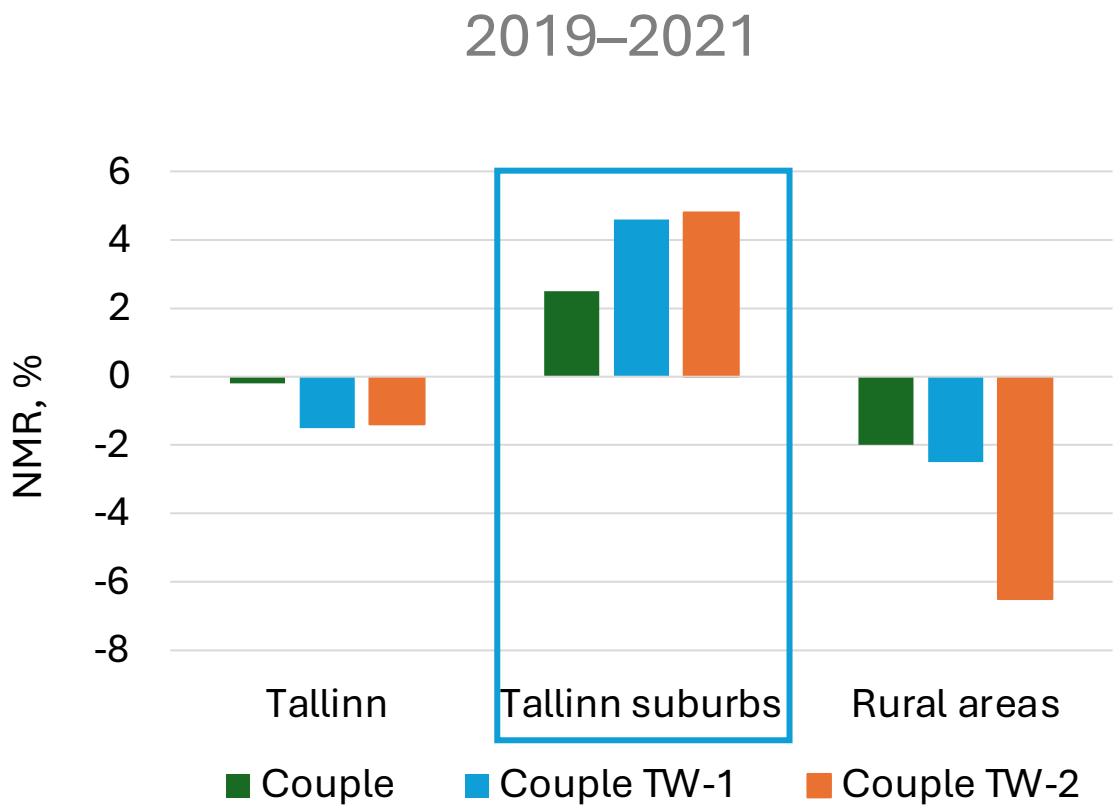
2019–2021

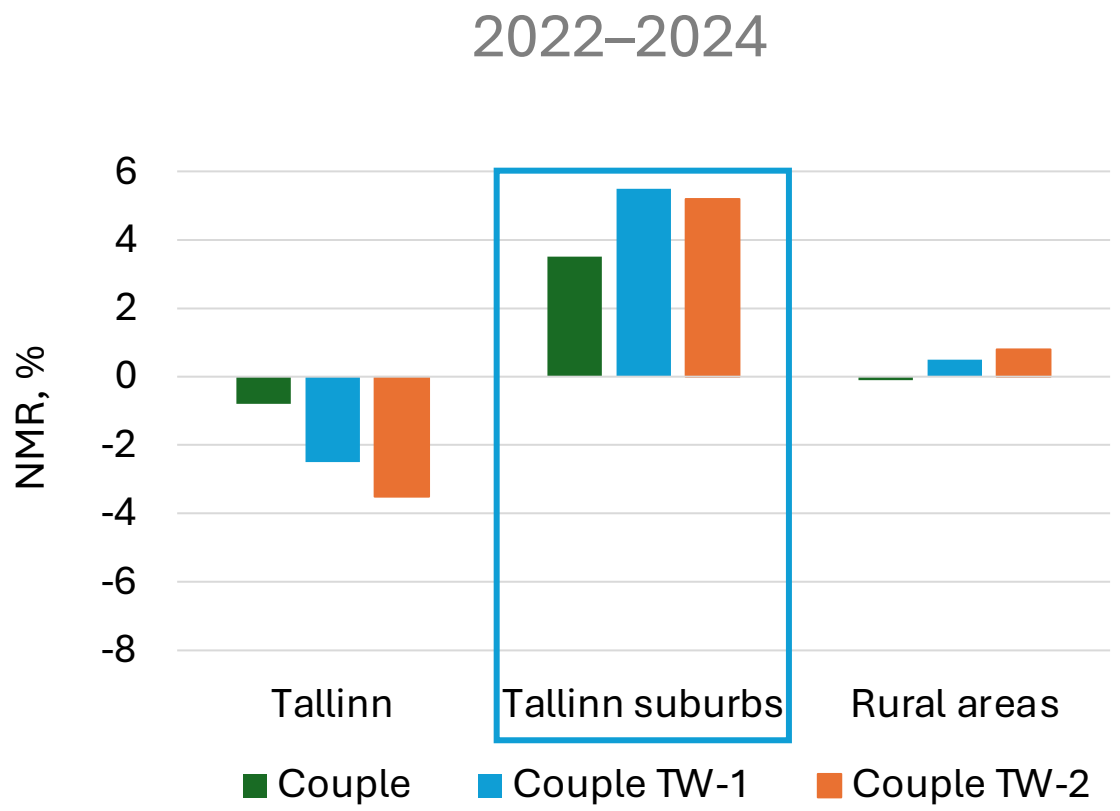


2022–2024



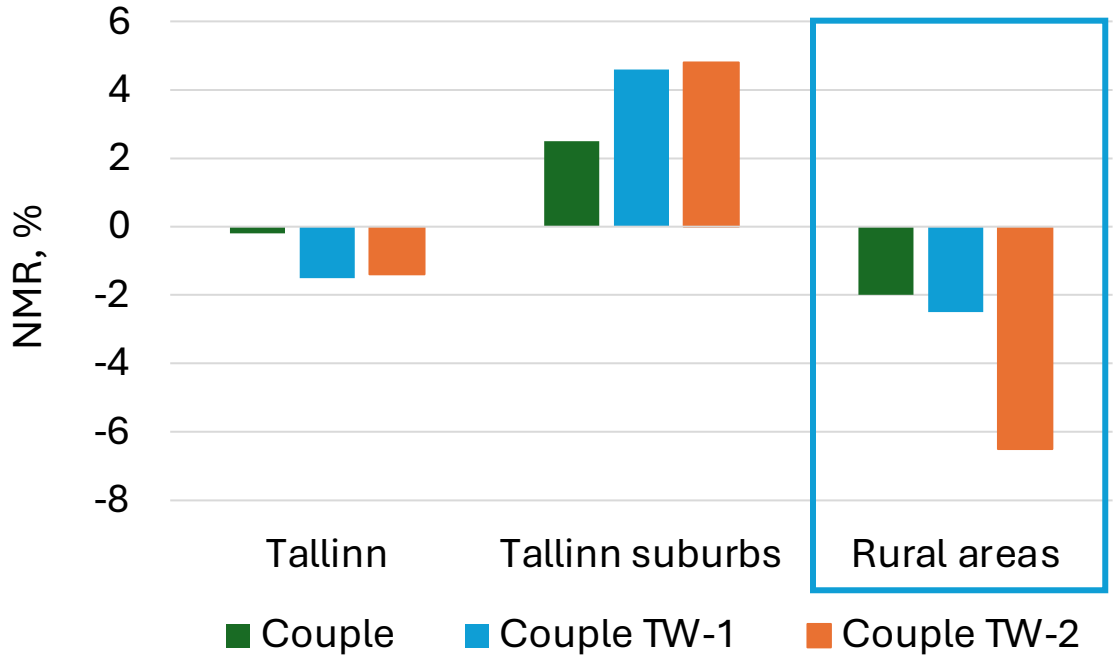
Migration of teleworkers and non-teleworkers



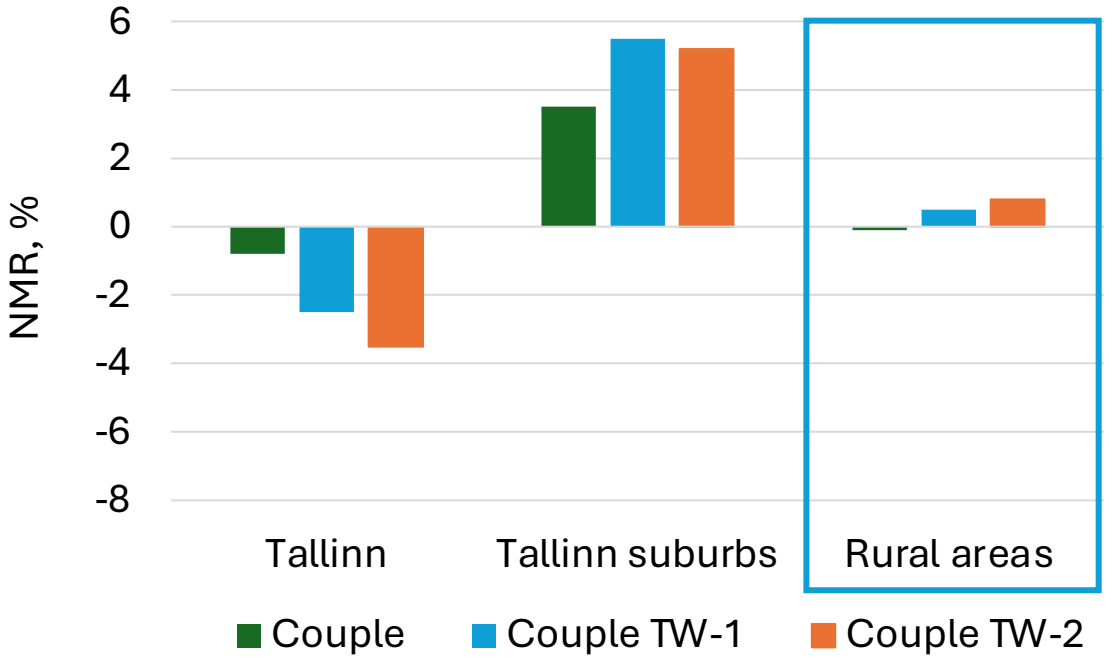


Migration of teleworkers and non-teleworkers

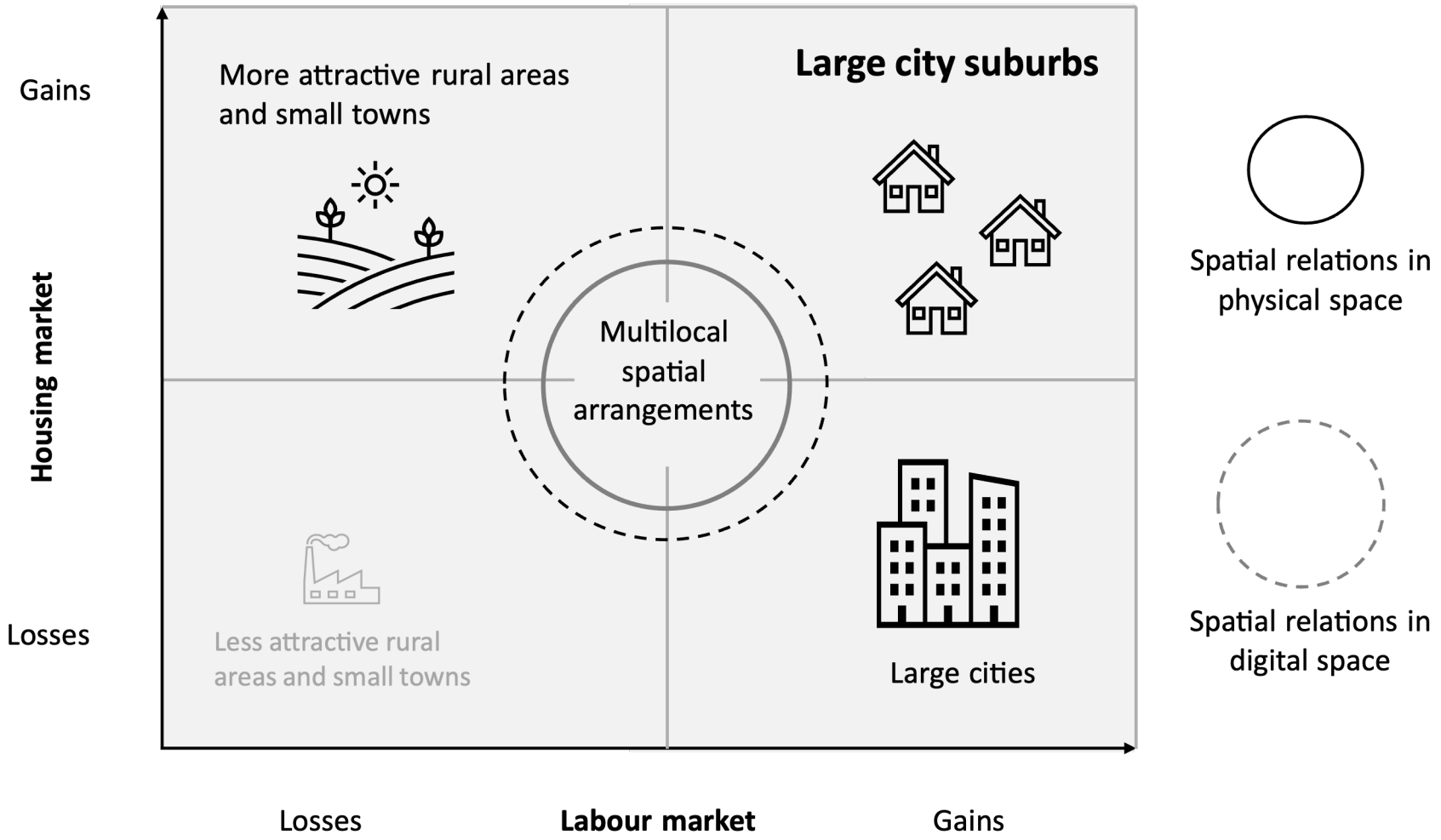
2019–2021



2022–2024



From place-bound to digitally mediated societies



Reflections and looking ahead

Digital transition as a selective amplifier

EXPECTATION

Increased segregation

New tech elites create new spatial divides and rising segregation

Social and class-based segregation dynamics differ

EXPECTATION

Nation-wide deconcentration

Remote work frees people from place, allowing for greater residential dispersal

Happens to some extent, ethnic differences

WHAT THE EVIDENCE SHOWS

Selective amplification

Accelerates ongoing and long-term processes:
professionalisation
life course and family dynamics
suburbanisation

Filtered by class, ethnicity and housing

Digital transition creates new forms of residential flexibility and advantage, but geographic outcomes remain conditioned by houshold dynamics, social inequalities and housing-market structures

Access without moving

PLACE-BOUND SOCIETY

Residence → **Selective moving: Move or commute**

DIGITALLY MEDIATED SOCIETY

Residence → **Selective staying: Stay and telework**

TIME-GEOGRAPHY

Telework relaxes the coupling constraint

Immobility becomes a form of access to jobs

And teleworkers spend more of the week at home: the home neighbourhood matters more for everyday exposure

Segregation research needs more attention to the mechanisms of staying

Same advantage, two pathways

MINORITY TECH WORKERS

ENTRY

Class-based mobility into affluent majority neighbourhoods within the city

City scale: desegregation

MAJORITY TECH WORKERS

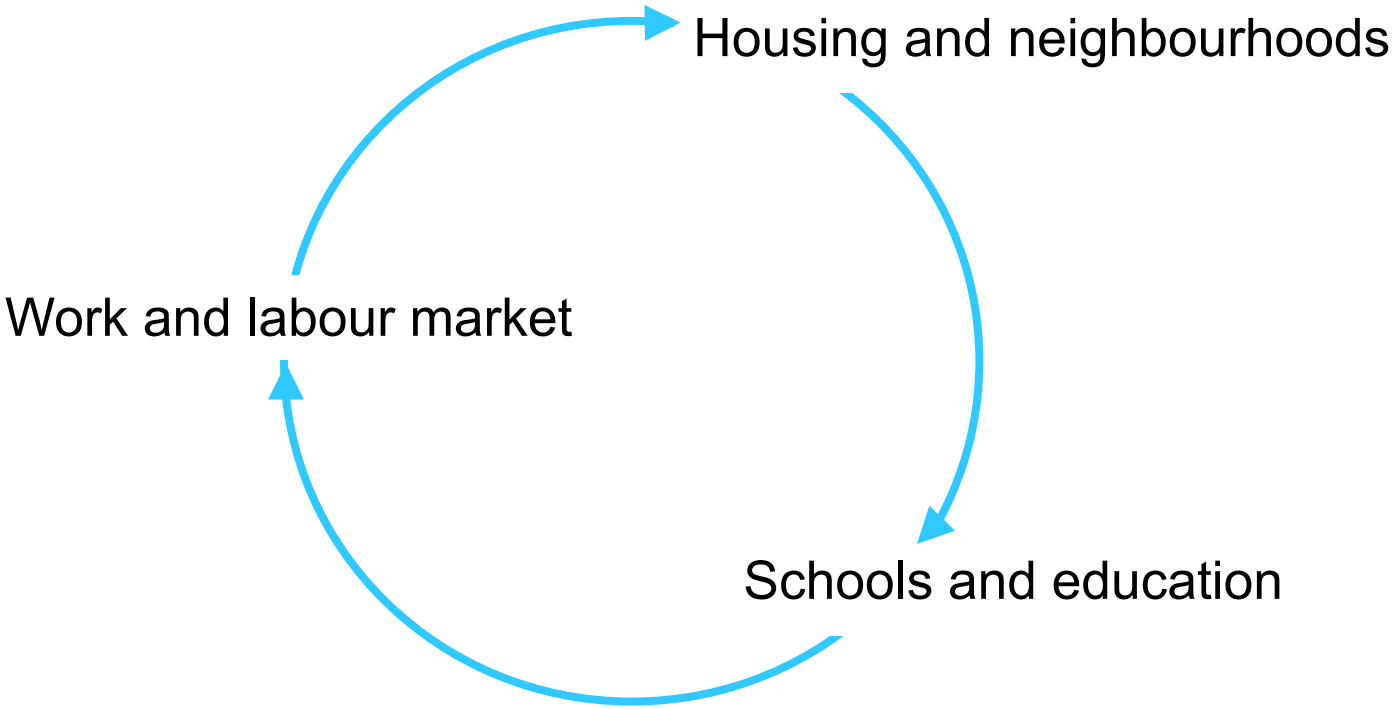
EXIT

Extended suburbanisation, with some movement beyond the metropolitan area.

Metropolitan and national scales: segregation

City-level desegregation can coexist with metropolitan-level and country-wide segregation: residential sorting has to be read across scales

Vicious and virtuous circles of segregation



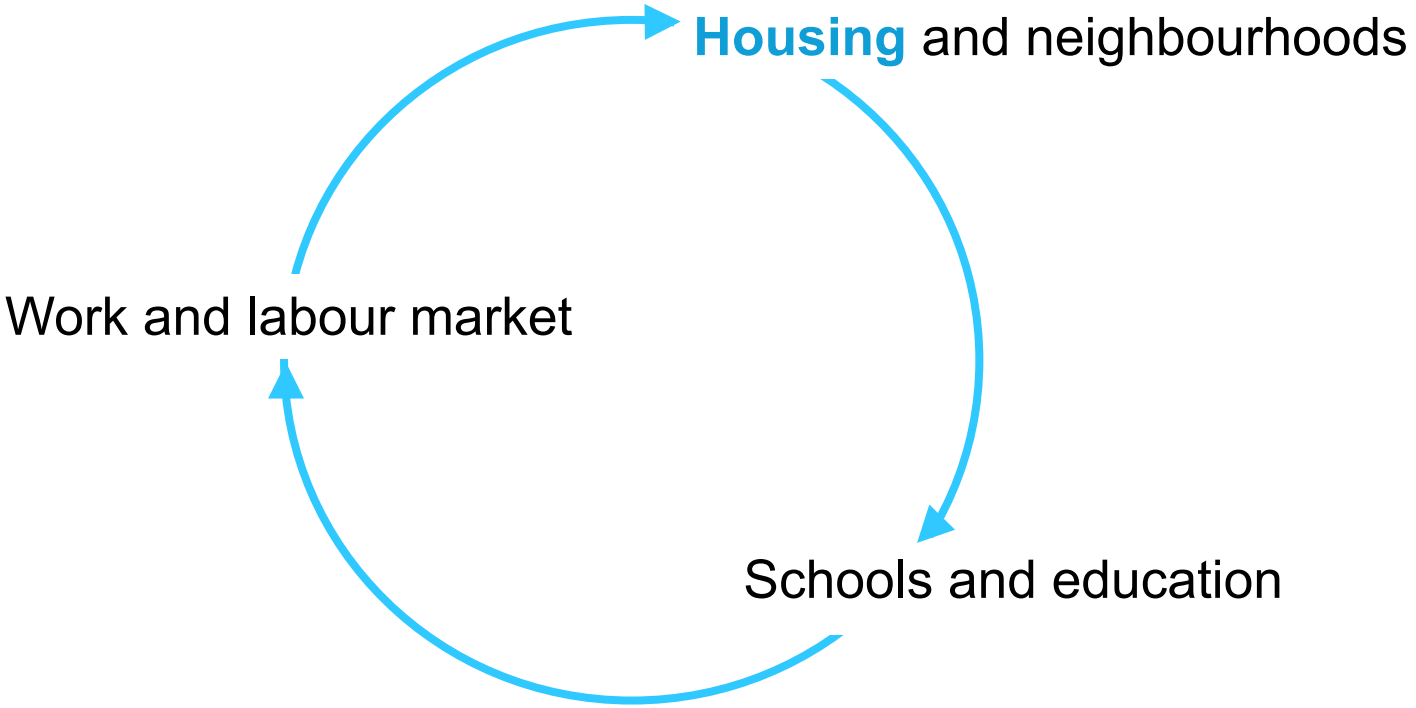
– **Vicious circle**

Majority households exit to suburbs while low-occupation minorities become more isolated

+ **Virtuous circle**

Minority tech workers turn social mobility into housing gains across ethnic lines

Digital transition pulls housing affordability in large cities in two directions



– Worsening housing affordability

Tech workers

Commodification

Platforms

+ Easing housing affordability

Remote work

Extended suburbanisation

Directions of future research

1 **Missing groups**

Platform workers, from place-bound delivery couriers to location-flexible professionals

2 **Beyond residence**

Activity spaces, multilocal living arrangments

3 **Social and spatial relations**

How digitally mediated social and spatial relations reshape each other

4 **Comparative studies**

How housing regimes and societal contexts shape the spatial outcomes of digital transition

Are we measuring segregation in the right places?

Digital spaces connect people across geographical boundaries, yet selective interactions and algorithmic filtering reinforce social boundaries.

✓ **Theoretical challenge**

If digitalisation relaxes coupling constraints, how does this change the relationship between geographical proximity and social interaction?

✓ **Methodological challenge**

How can we measure segregation within and across physical and digital spaces?



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SOCIAL INCLUSION

Volume 14

2026

Digital Transition and New Forms of Spatial Inequality

Open Access Journal

ISSN: 2183-2803

Edited by Tiit Tammaru, Kadi Kalm, and Rūta Ubarevičienė

Thank you!

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University of Tartu

circle of segregation

CENTRE OF EXCELLENCE IN ENERGY EFFICIENCY

IMO

INFOTECHNOLOGICAL MOBILITY OBSERVATORY

This research was supported by the Estonian Ministry of Education and Research through the Centre of Excellence in Energy Efficiency (ENER), grant TK230U7