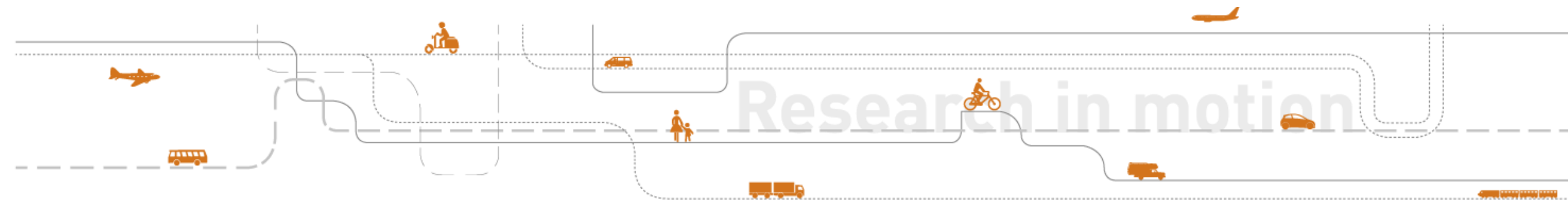# Who buys public transport accessible housing?

Exploring house prices and residential mobility in the Oslo region

mobil.TUM, 10. April 2024
Erik B. Lunke and Lars Böcker
Institute of Transport Economics, Norway
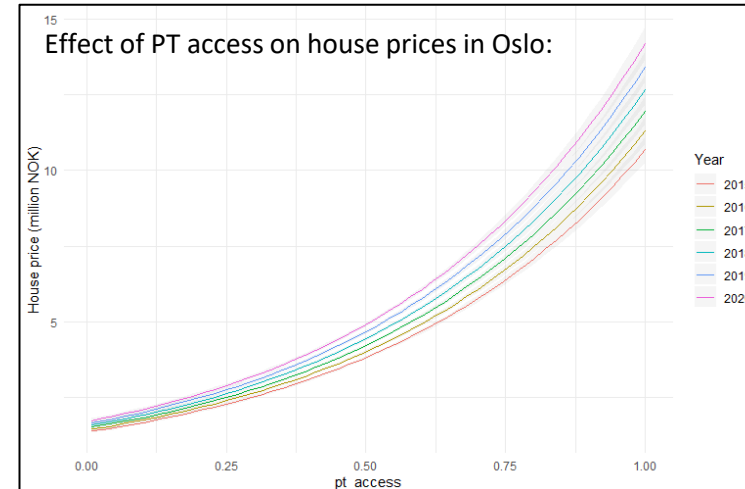
Research in motion

Background

- Accessibility with public transport (PT) is a **limited** and **valued** residential asset
  - *Contributes to increased property prices*

- PT accessibility is an important outcome of residential mobility decisions.
  - *Provides car-free access to urban opportunities*

- Is PT access related to gentrification and exclusion?
  - *Somewhat debated*
  - *Little empirical documentation of a relationship between PT and exclusion (Padeiro et al. 2019, Rayle 2015, Rice et al. 2020)*
  - *Carleton et al. (2022) found little evidence of exclusion, despite high price variation*

Theoretical framework:
- Transport justice and transport equity (Litman 2006)
- Spatial justice, segregation, gentrification (Soja 2009, Musterd 2003 +++)
- Life course and mobility biographies (Clark & Huang 2003, Lanzendorf 2003)

Effect of PT access on house prices in Oslo:

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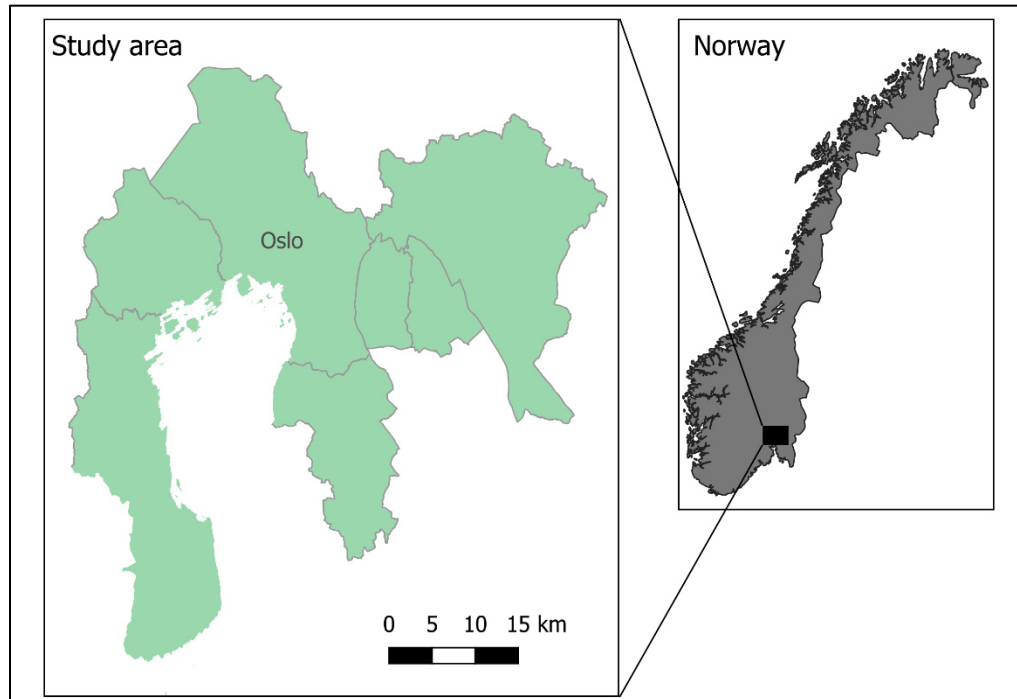Norwegian Centre for Transport Research

Research questions

Does the influence of PT accessibility on house purchase decisions vary with household income?

To what extent does these patterns vary between different life course stages?

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Study area / Norway

0 5 10 15 km

Study area:

- Oslo + municipalities with >20 commuting to Oslo
- (where data was available)
- Oslo, Asker, Bærum, Lillestrøm, Lørenskog, Nordre Follo, Rælingen

Data set:

- Administrative registry data
- All households who bought a house in 2018
  - House transactions
  - Linked to sociodemographic characteristics of households
  - Home **owners** (80 % in Norway)

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Analytical approach

- **Sample**: All households making a house purchase in the Oslo region in 2018

- **Conditional logit models**

$$p_{ij}(N_j, C_{(i)}) = \sum_{K=1}^{k} \frac{exp(\beta N_j)}{exp(\beta N_k)}$$

- that measure the likelihood of house selection…
  - *Compared to all dwellings on the market in the same period*
  - *Choice set: Random subsample of 100 dwellings*
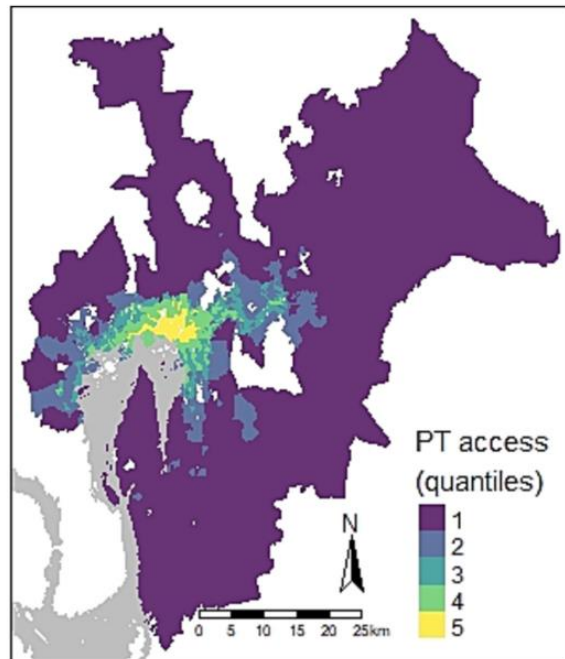
- **Stratified** by
  - *Income*
  - *Family type*

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Independent variables

Key independent variable:

PT accessibility

- Access to employment opportunities via PT
- Gravity model – weighted by travel time
- Census tract level

Control variables:

- Population in neighbourhood
    - *Share of non-western immigrants*
- Urban form
    - *Population density*
    - *Building use diversity*
- Road noise
    - *Share of adresses in the census tract in red/yellow noise zone*
- Green surroundings
    - *Median NDVI level in census tract*
- East/west
- House size
- House type

Not included:
- *Price*
- *Previous location*

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Strata – income and family type

	Low income*	Medium income*	High income*
Young, childless (<40 years)			
With small children (-2 – 5 years)			
With older children (6 - 17 years)			
Mid age, childless (40 - 60 years)			
Older, childless (60+ years)			

*Household income
Low: decile 1-3
Medium: decile 4-7
High: decile 8-10

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Results – house buyers

	(1) <40 low b	(2) med b	(3) high b	(4) 40-60 low b	(5) med b	(6) high b	(7) >60 low b	(8) med b	(9) high b
chosen									
PT access percenti~)	0.383***	0.088*	0.346***	-0.420**	-0.397***	-0.057	-0.492***	-0.388***	-0.032
Apartment	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Multi-family	-0.722*	-0.089	-0.036	-0.288	-0.390**	-0.669***	-1.424***	-1.838***	-1.875***
Single-family	0.589*	0.574***	0.171	0.260	-0.439*	-0.525***	-1.809***	-1.735***	-1.638***
House size (std)	-1.015***	-1.137***	-0.180***	-0.834***	-0.467***	0.127**	-0.284*	-0.188*	0.190***
west	-0.096	-0.386***	-0.209***	0.346**	-0.191*	0.198***	0.300*	0.381***	0.376***
Density (std)	0.061	0.070**	0.086**	-0.030	-0.077	-0.043	-0.144	-0.422***	-0.317***
Diversity (std)	-0.031	0.039	0.049	-0.028	0.000	0.037	-0.111	-0.070	0.013
Nonwestern imm sha~)	-0.049	0.014	-0.197***	0.335***	0.094**	-0.175***	0.138*	0.042	-0.319***
Red/yellow noise l~t	0.018	0.055*	0.002	-0.017	0.045	-0.020	0.030	0.083	-0.088*
mean NDVI (std)	0.010	0.098**	-0.004	-0.001	0.002	-0.158***	-0.262**	-0.166**	-0.215***
Observations	56987	224527	201251	27956	84708	130322	29311	75444	86088
r2_p	0.0723	0.0564	0.0292	0.0577	0.0303	0.0101	0.0482	0.0541	0.0421

	(1) small chil~w b	(2) med b	(3) high b	(4) older chil~w b	(5) med b	(6) high b
chosen						
PT access percenti~)	-0.253	-0.258***	0.378***	-0.532***	-0.440***	-0.068
Apartment	0.000	0.000	0.000	0.000	0.000	0.000
Multi-family	-0.054	0.565***	1.156***	-0.441*	0.166	-0.013
Single-family	-0.638*	0.133	0.909***	-0.692*	0.016	0.270
House size (std)	0.255**	0.090**	0.221***	0.147	0.097	0.290***
west	-0.290	-0.377***	0.113*	-0.002	-0.146	0.430***
Density (std)	-0.134	-0.040	-0.115**	0.123	-0.044	0.081
Diversity (std)	-0.078	-0.068*	-0.049	-0.015	-0.113*	-0.038
Nonwestern imm sha~)	0.436***	0.168***	-0.253***	0.454***	0.217***	-0.136**
Red/yellow noise l~t	-0.038	0.048	-0.072**	-0.006	0.064	-0.035
mean NDVI (std)	0.098	0.190***	0.078*	0.121	-0.011	-0.108
Observations	26947	176530	231834	31008	75419	86399
r2_p	0.0697	0.0401	0.0742	0.0779	0.0338	0.0359

Results – house buyers

	(1) <40 low	(2) med	(3) high	(4) 40-60 low	(5) med	(6) high	(7) >60 low	(8) med	(9) high
	b	b	b	b	b	b	b	b	b
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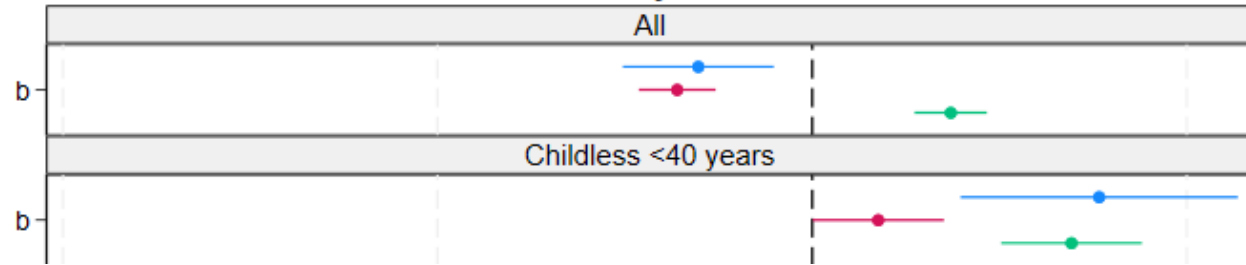# Results – house buyers

PT accessibility coefficient

Legend:
- Low income
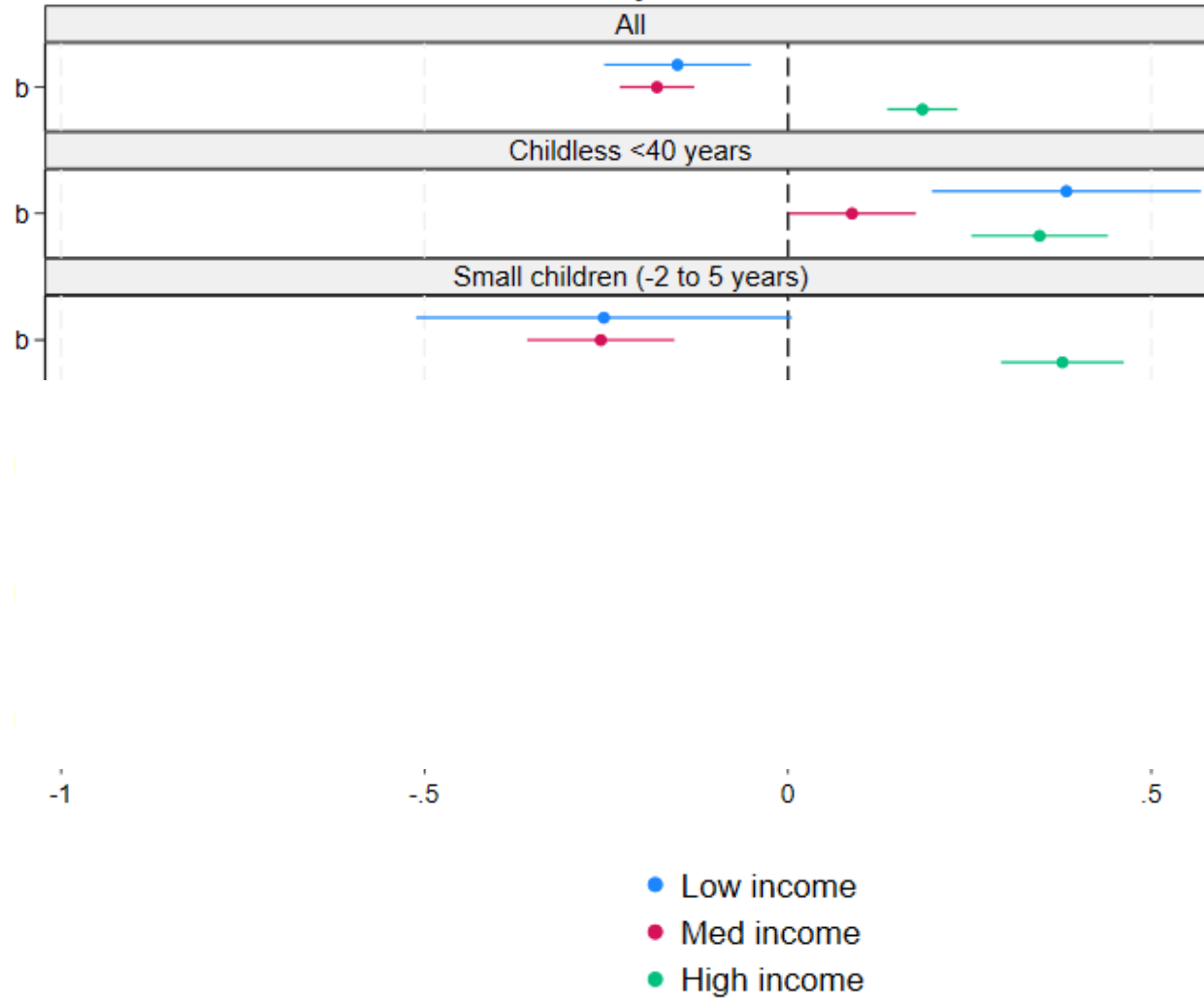- Med income
- High income

Results – house buyers

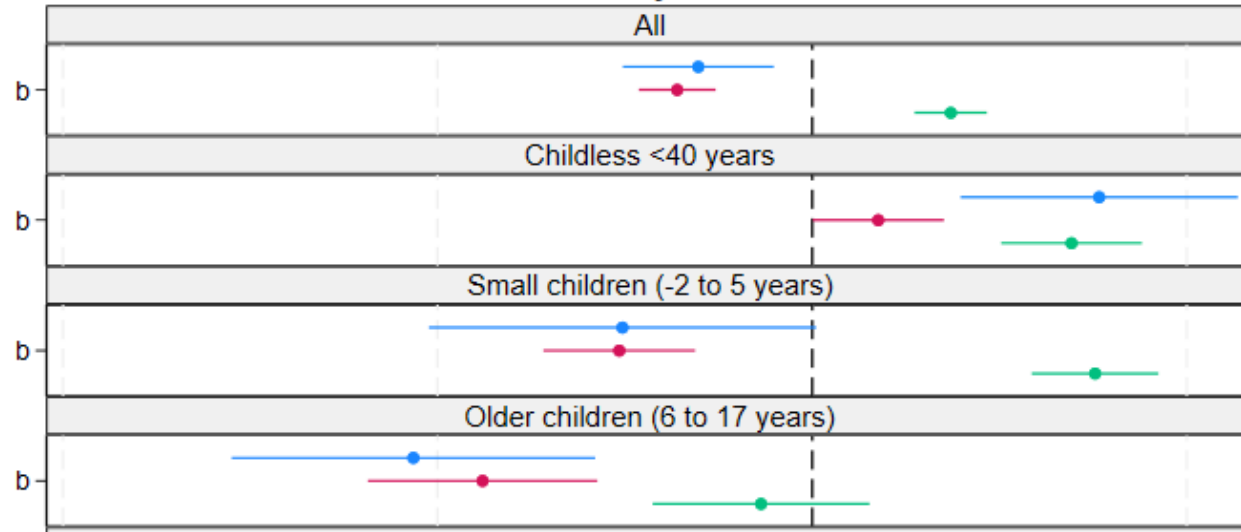PT accessibility coefficient

- Low income
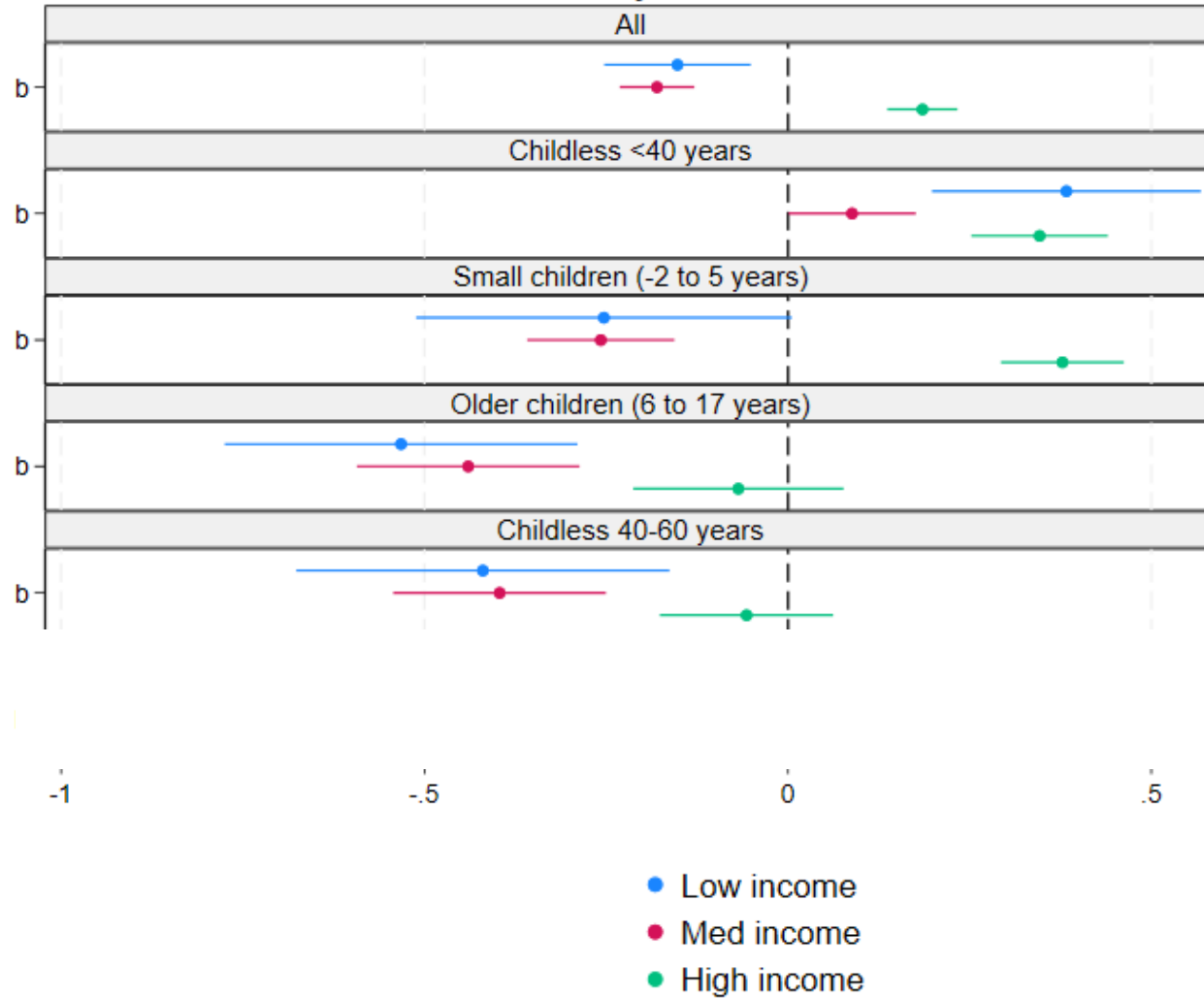- Med income
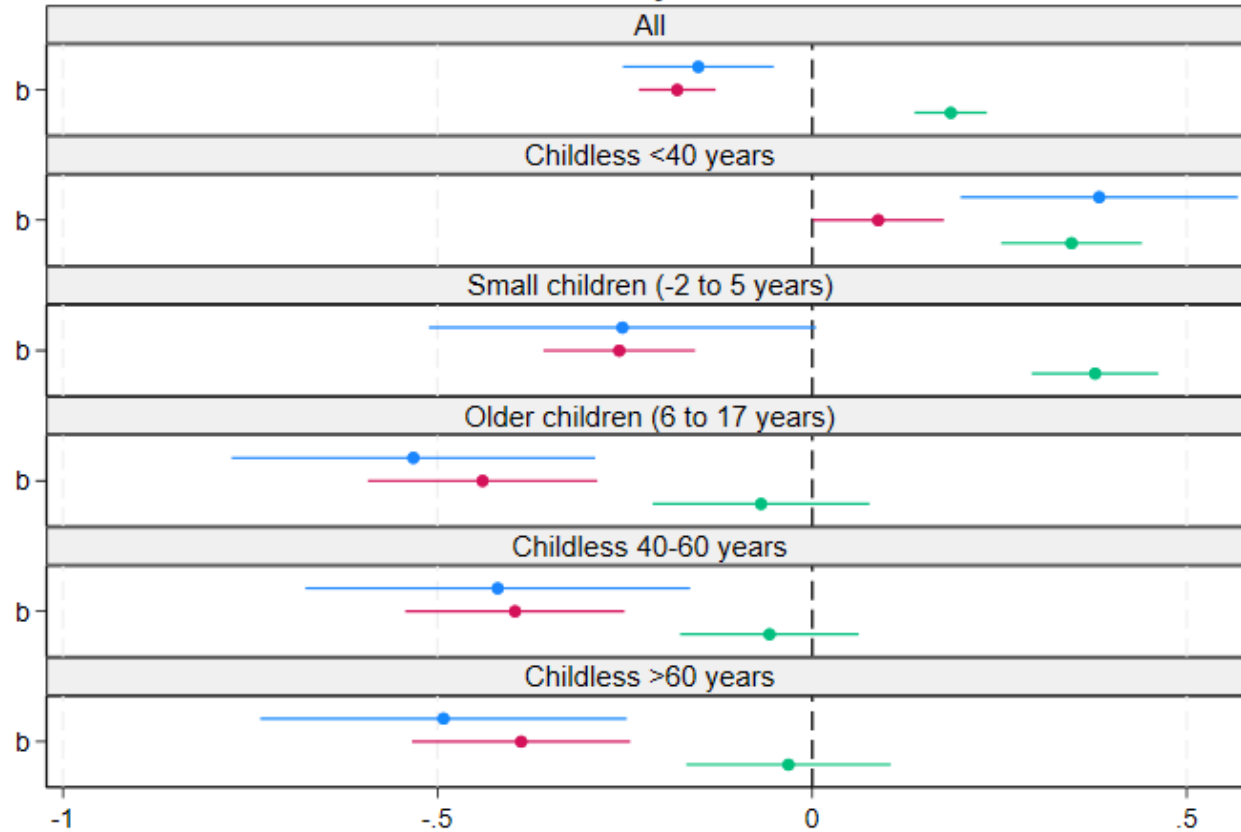- High income

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Results – house buyers

Results – house buyers

PT accessibility coefficient

Low income
Med income
High income
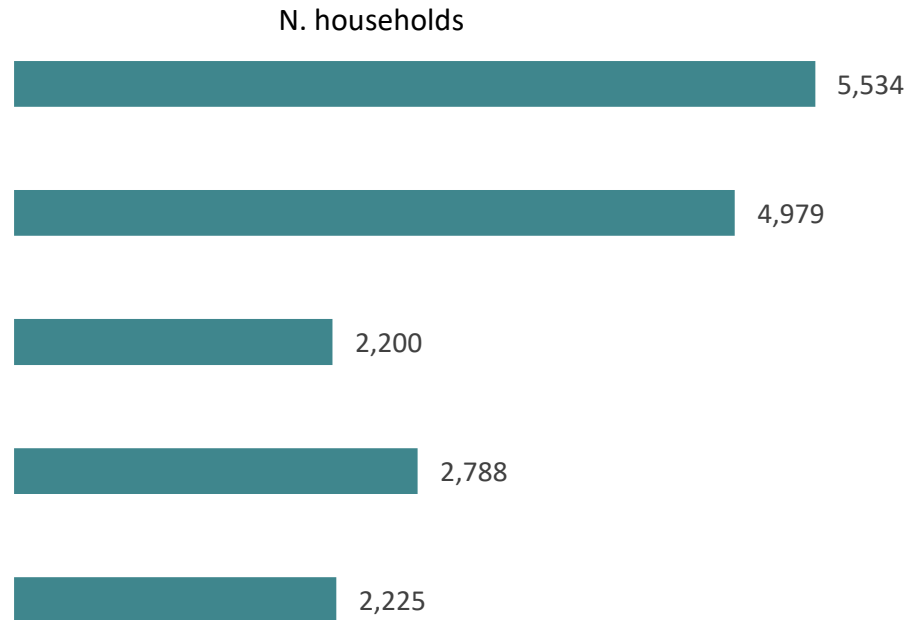
Results – house buyers

PT accessibility coefficient

Results – house buyers

Summary

- Limitations:
  - *Not measuring the real **preference** for PT accessibility*
    - Trade-off between preferences and limitations
  - ***Price** influences the choice set, and the obtainable level of PT access*
  - ***Previous location** influences decision, and PT accessibility*

- Conclusion
  - *We document a substantial **sorting** of various income groups to different levels of PT access*
  - *Although with **large variation across the life course**, on average, high-income households move to better PT access than low- and medium income households*

Thank you!

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