Is congestion pricing fair?

Consumer and citizen perspectives on equity effects

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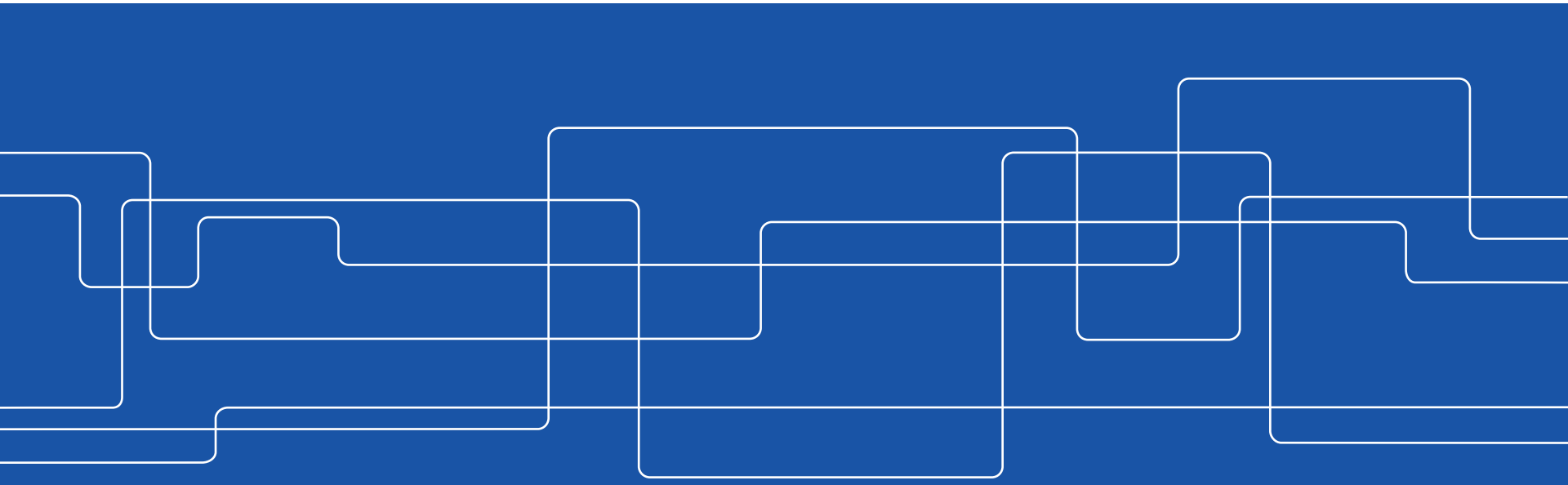


Two views of ”fairness”

- ”Consumer” and ”citizen” perspectives – complementary
  - ”Homo economicus” vs. ”homo politicus”
  - ”Personal well-being” vs. ”subjective social welfare”

- Consumer: travel costs, travel times, use of revenues…
  - Which socioeconomic groups win and lose from a reform
  - Traditional equity analysis

- Citizen: principles, procedures, allocation mechanisms
  - Is the underlying principle, rationality, motivation of a reform ”fair” or ”just”
  - These views may also differ across socioeconomic groups
  - Is congestion pricing an ”elite” project? I.e. better aligned with an ”elite’s” view of what is ”fair” or ”just”?

Data

- Survey data from Stockholm, Gothenburg, Helsinki, Lyon
- Questions about travel patterns & attitudes

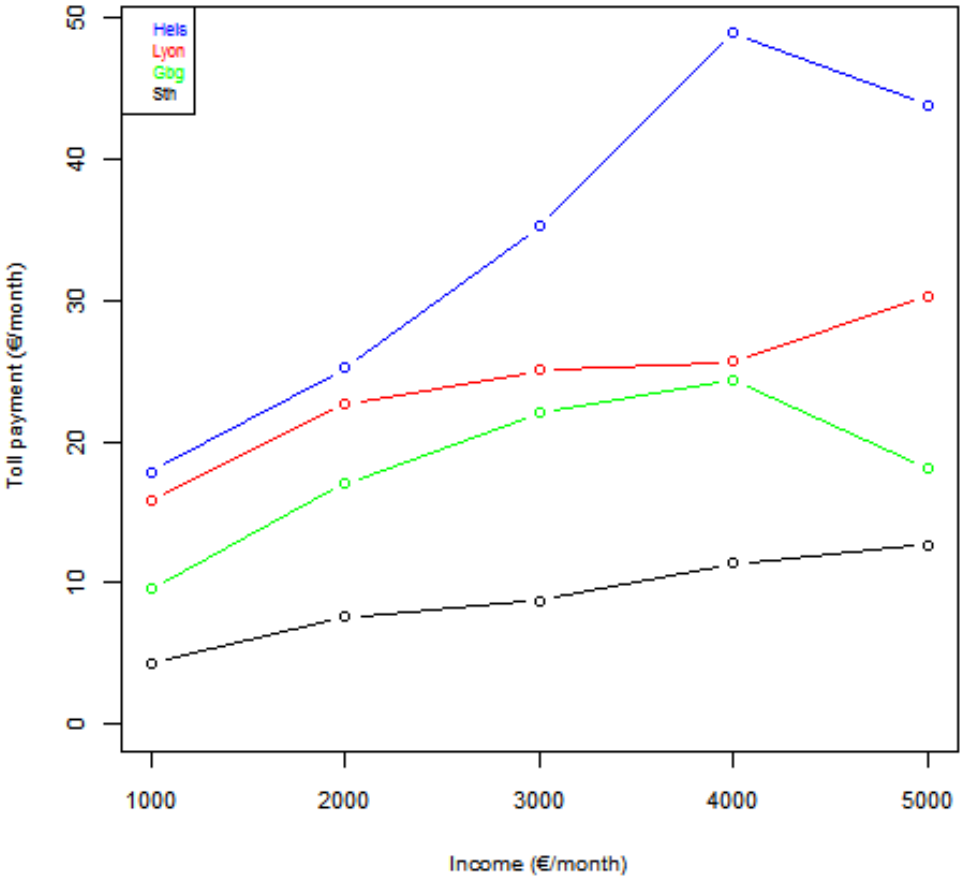
- Stockholm introduced congestion pricing 2006
- Gothenburg introduced congestion pricing 2013
- Helsinki: proposed zone-distance system – never introduced
- Lyon: hypothetical area scheme

Consumer perspectives

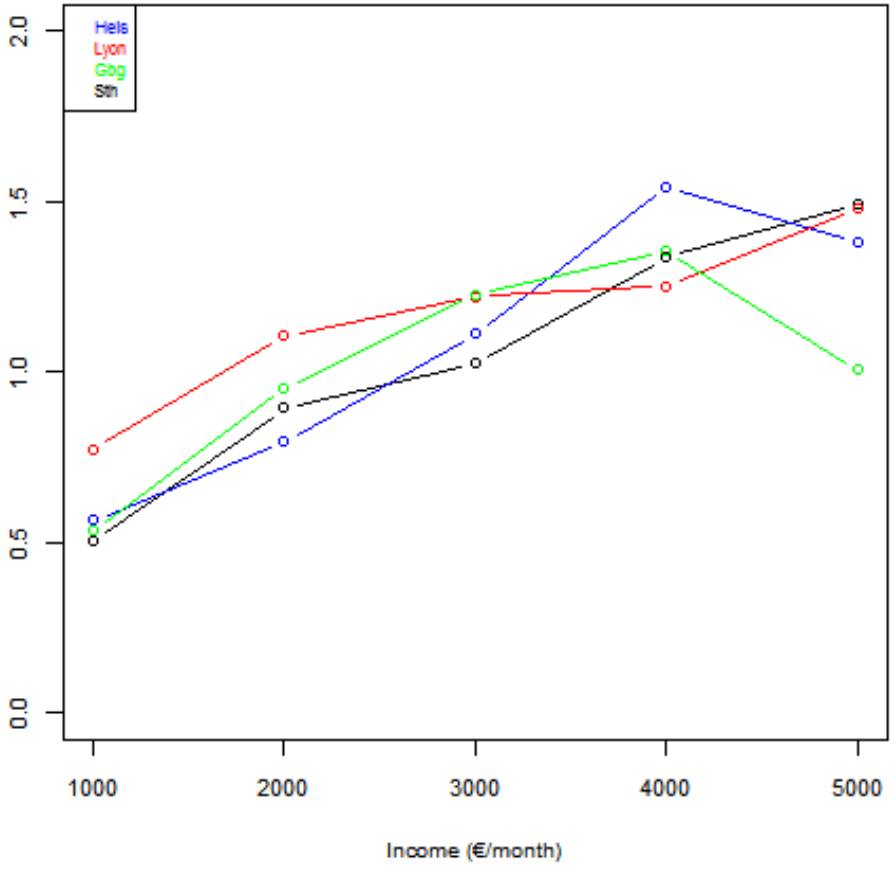
Toll payments per income group: Rich pay more

Hels
Lyon
Gbg
Sth

€/month



Relative to average payment



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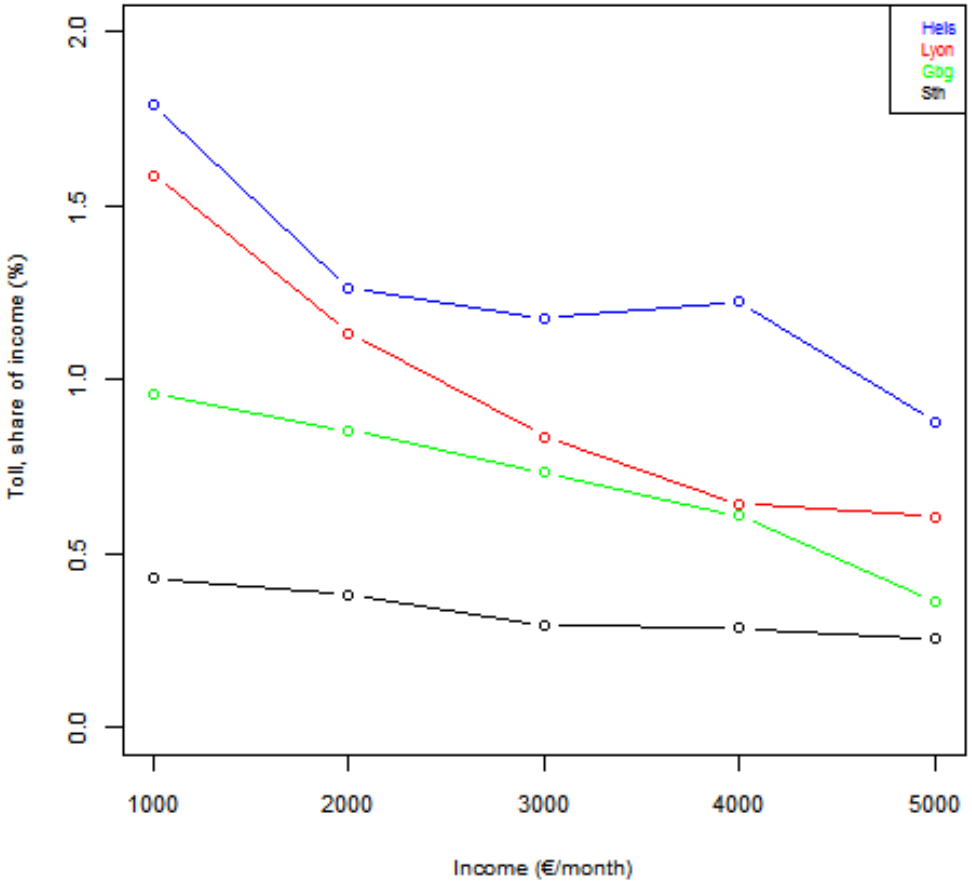
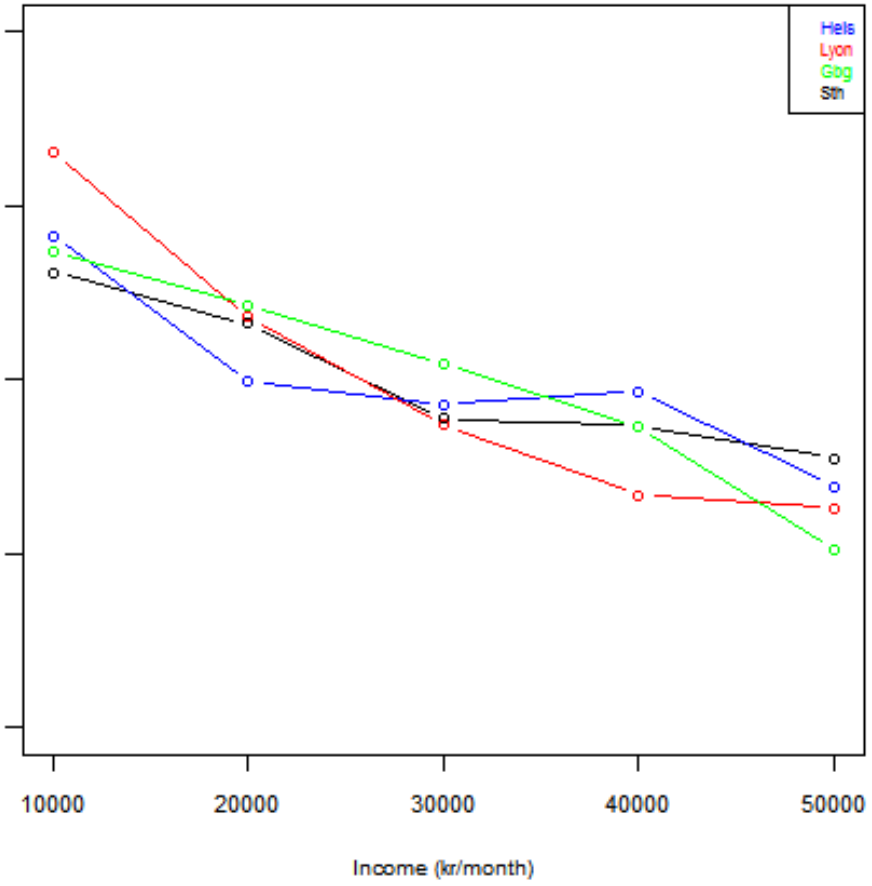
Toll payments as share of income: Poor pay larger share of income

Hels
Lyon
Gbg
Sth

Percentage of income



Relative to average percentage



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Fair?

- Rich pay more – but poor pay larger share of their income

- Problematic if the purpose is to generate revenues
- OK if the purpose is to correct prices
  - Prices are usually the same for everyone, for efficiency reasons and to avoid paternalism
  - Increased economic equality usually achieved by taxation and welfare systems

”Compound self-interest” measure

- Broaden the self-interest measure to include
  - Value of time savings
  - Number of car trips
  - Number of cars in household

- Combine these variables in one self-interest measure

- Construct relative weights from how the variables affect attitudes to congestion pricing

Model estimation

- ”How would you vote in a referendum about congestion pricing?”
  - Answer 1-5: Most likely yes, Probably yes, No opinion, Probably no, Most likely no
- Estimate ordered logit model
  - regressing the answer i on the self-interest variables $\mathbf{X}$

$$y = \boldsymbol{\beta}\mathbf{X} + \varepsilon$$

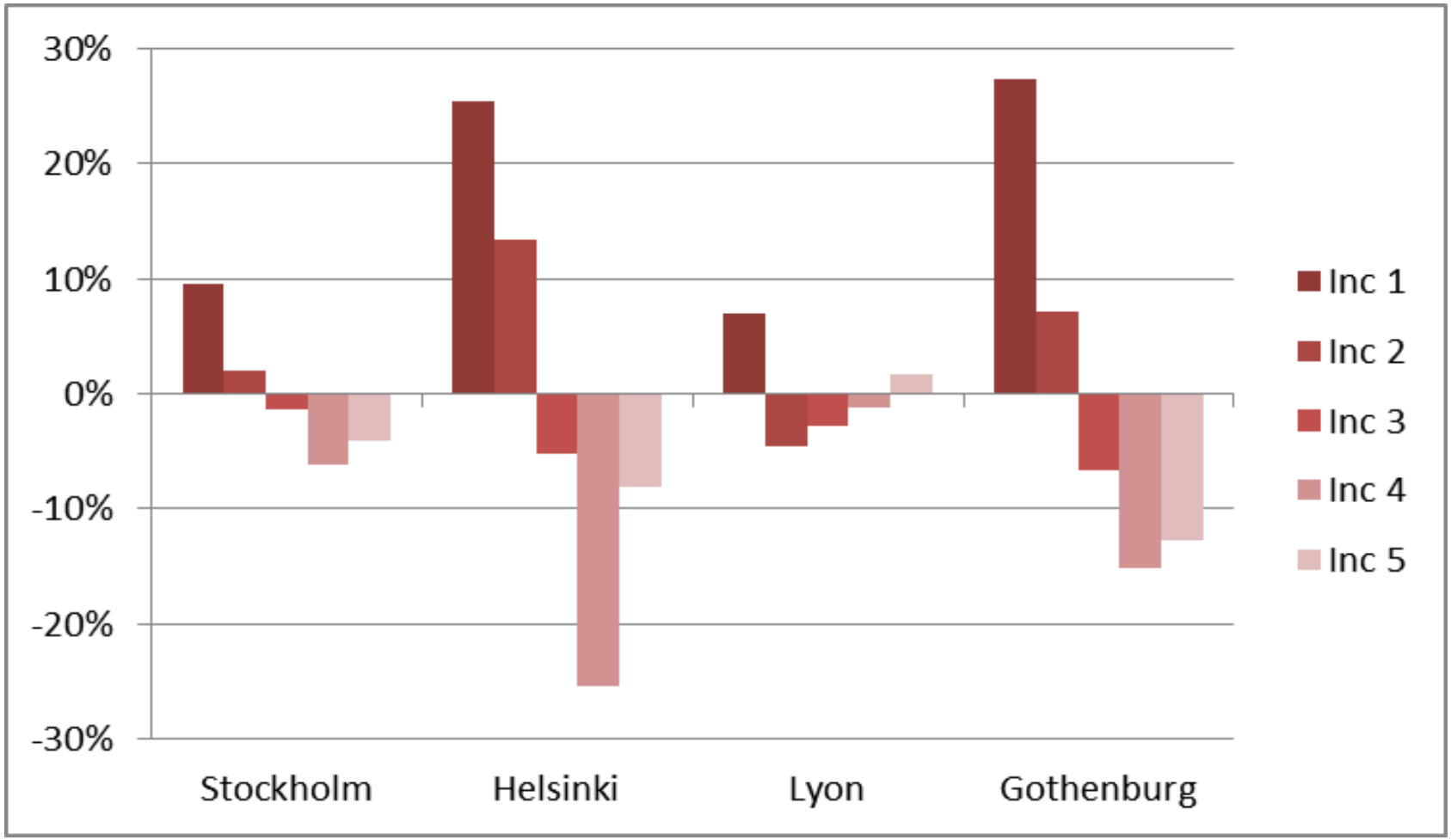
$$P_i = \frac{1}{1 + \exp(\mu_i - \beta X)} - \frac{1}{1 + \exp(\mu_{i-1} - \beta X)}$$

- y measures ”compound self-interest” (latent)

Estimation results

	Parameter	*T-stat*
Tolls	-0.0011	*-9.6*
Tolls,add.inc.grp1	-0.0008	*-3.6*
No car	0.3062	*5.0*
Car trips	-0.4306	*-15.1*
Value of time, drivers	0.0189	*12.6*
Stockholm	0.9949	*14.9*
Helsinki	0.0214	*0.3*
Lyon	-0.1767	*-2.4*
Gothenburg2014	0.5572	*8.0*

Compound self-interest by income group



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Citizen perspectives

Citizen perspectives

- Opinions about what is “fair” or “just” may vary across socioeconomic groups
- Is the concept of congestion pricing better aligned with high-income groups’ views about what is “fair” or “socially desirable”?

- What *is* the “concept of congestion pricing”?
- Includes
  - Allocating a scarce resource according to willingness to pay
  - Similarity to taxes: transfer resources from individuals to the government
  - Environmental effects

Views of fairness (positive number = agree)

		Sth	Hels	Lyo	Gbg
1	“Considerably more resources should be used to protect the natural environment.”	1.4	1.3	2.1	1.3
2	“The government should prioritise to reduce the differences between the rich and the poor.”	0.9	1.2	1.7	1.3
3	”Taxes in [country] are too high”	0.8	1.2	1.3	0.3
4	Pricing the ferry is fair	1.9	1.4	0.3	0.9
5	Queueing to the ferry is fair	1.5	2.1	-1.2	0.8
6	Public agency deciding space on the ferry is fair	0.1	-1.1	-1.6	-0.7
7	Giving out places on the ferry with a lottery is fair	-1.1	-1.3	-2.3	-2.2
8	“It is fair that airplane tickets cost more for departure during peak hours than during off-peak”	0.9	0.8	-0.4	0.3
9	“It is fair that airplane tickets to vacation destinations cost more when the weather in [country]is bad.”	-1.0	-1.2	n/a	-1.4
10	“It would be fair if transit fares were lower in off-peak”	1.0	0.6	0.7	0.9

Correlation with income (positive = rich agree more)

		Sth	Hels	Lyo	Gbg
1	“Considerably more resources should be used to protect the natural environment.”	-0.06	-0.10	-0.02	-0.04
2	“The government should prioritise to reduce the differences between the rich and the poor.”	-0.19	-0.27	0.00	-0.17
3	”Taxes in [country] are too high”	0.06	-0.03	-0.01	0.02
4	Pricing the ferry is fair	0.00	0.01	0.01	0.02
5	Queueing to the ferry is fair	-0.08	-0.03	0.03	-0.05
6	Public agency deciding space on the ferry is fair	0.02	0.01	-0.02	0.01
7	Giving out places on the ferry with a lottery is fair	-0.05	-0.02	0.01	-0.02
8	“It is fair that airplane tickets cost more for departure during peak hours than during off-peak”	0.09	0.01	0.03	0.13
9	“It is fair that airplane tickets to vacation destinations cost more when the weather in [country]is bad.”	0.09	0.02	n/a	0.11
10	“It would be fair if transit fares were lower in off-peak”	0.00	-0.06	0.02	-0.03

”Citizen utility”

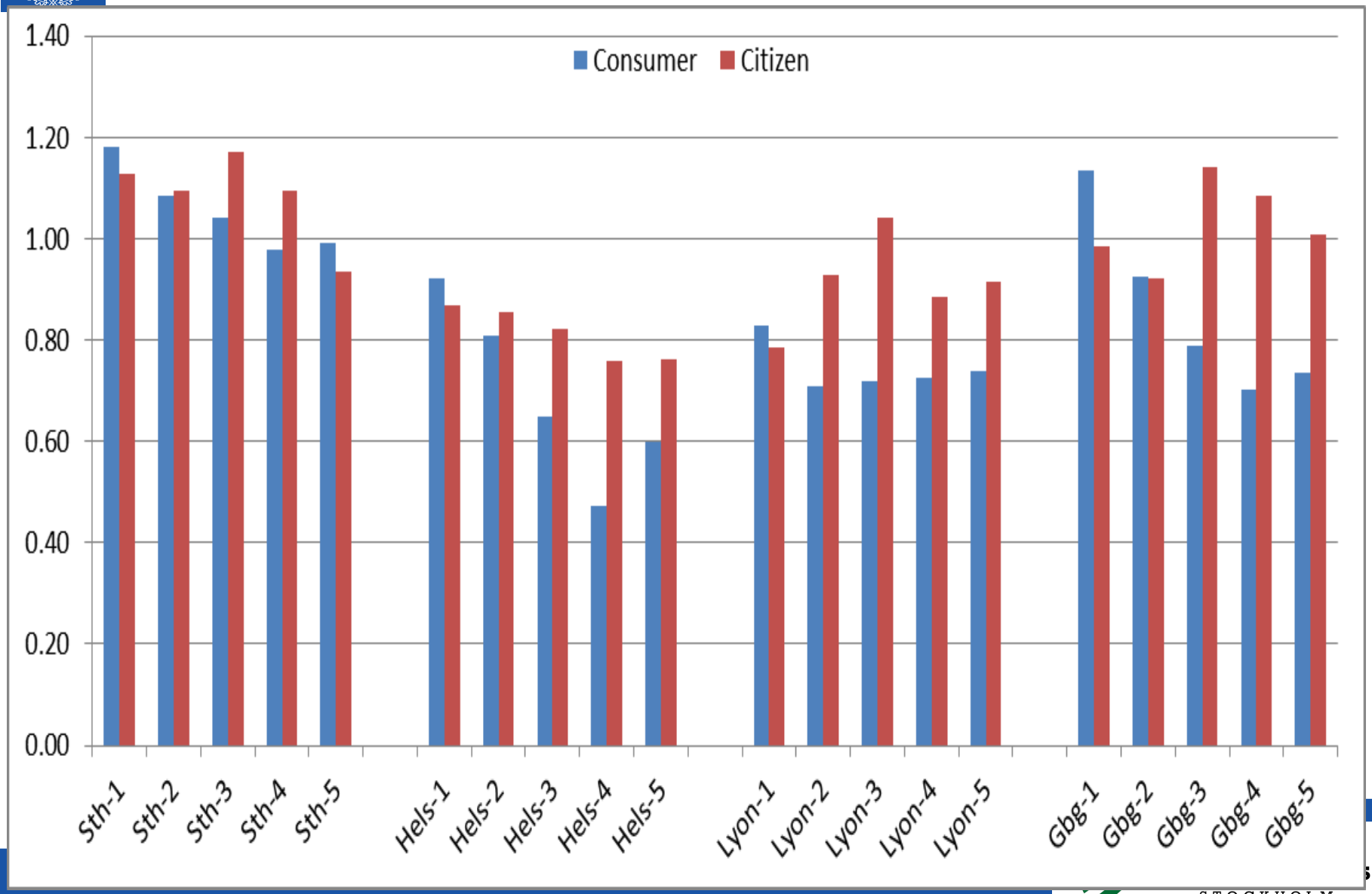
- Estimate model of correlation between attitudes to congestion pricing and attitudes to allocation mechanisms, pricing, taxation, environment *(controlling for self-interest)*

- The latent variable (the ”citizen utility”) measures how well aligned congestion pricing is with a respondent’s socio-political (”citizen”) attitudes

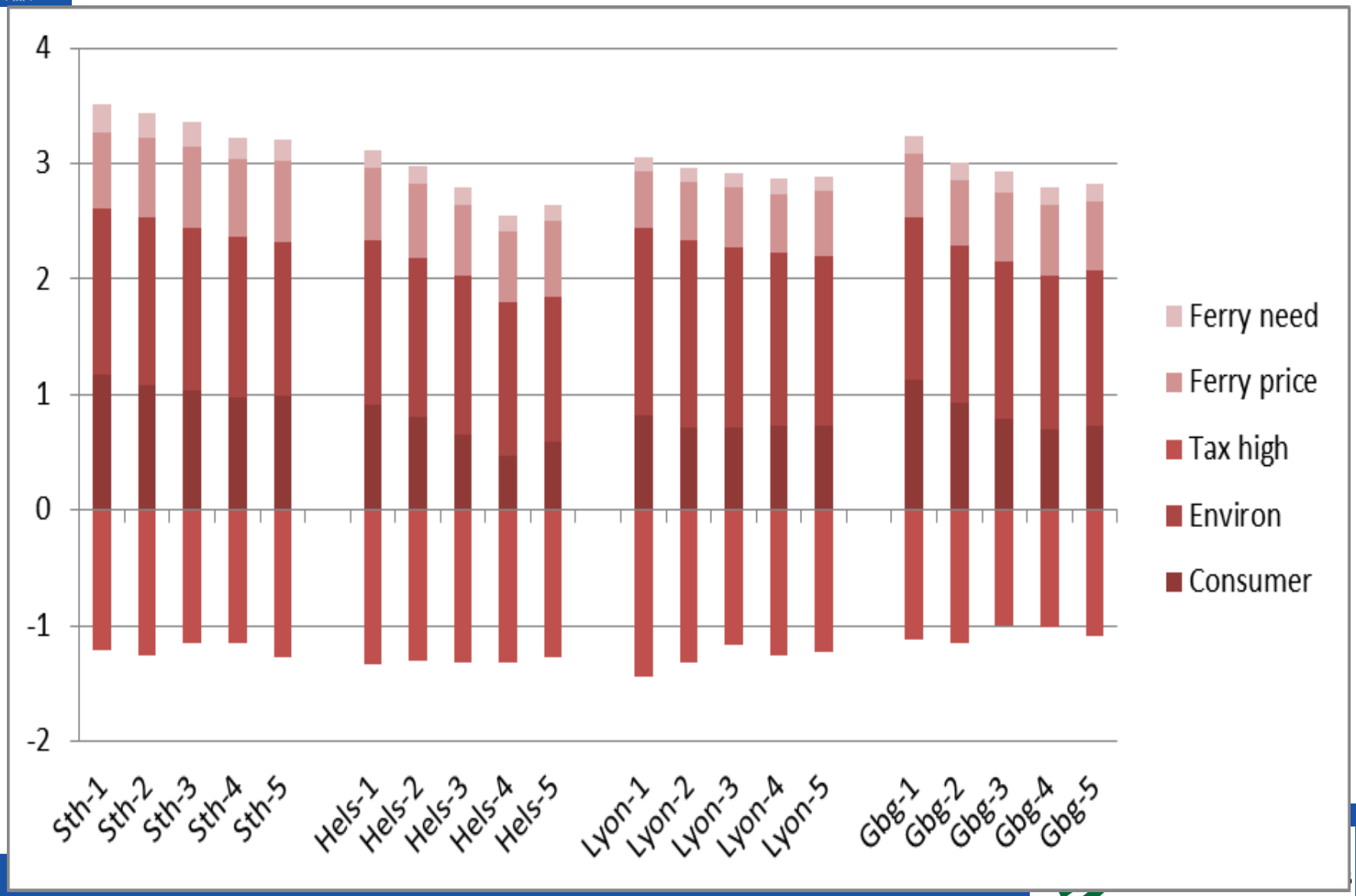
Estimation results

	Parameter	*T-stat*
Tolls	-0.0010	*-8.6*
Tolls,add.inc.grp1	-0.0006	*-2.6*
No car	0.3298	*5.1*
Car trips	-0.3328	*-11.0*
Value of time, drivers	0.1825	*9.1*
Stockholm	1.0064	*14.1*
Helsinki	0.1555	*2.0*
Lyon	-0.0990	*-1.3*
Gothenburg2014	0.5616	*7.2*
Environment	**0.2610**	***15.7***
Taxes too high	**-0.2524**	***-21.3***
Pricing is fair	**0.1172**	***10.2***
Agency is fair	**0.0504**	***5.1***
Equity is priority	**-0.0042**	***-0.3***

Consumer and citizen utilities by income group



Components of citizen utility



Conclusions

- No support that congestion pricing is ”unfair” from citizen perspective
  - Small differences across income groups; middle income groups slightly ”better off” than the richest and poorest
- The (perceived) purpose of congestion pricing affects attitudes – tax, environmental measure, allocation mechanism?

- Rich pay more than the poor – but pay lower share of their income
- OK if price correction, but regressive tax source