E4BEL steering committee

Brussels, 4th of February, 2025

Bureau fédéral du Plan
Analyses et prévisions

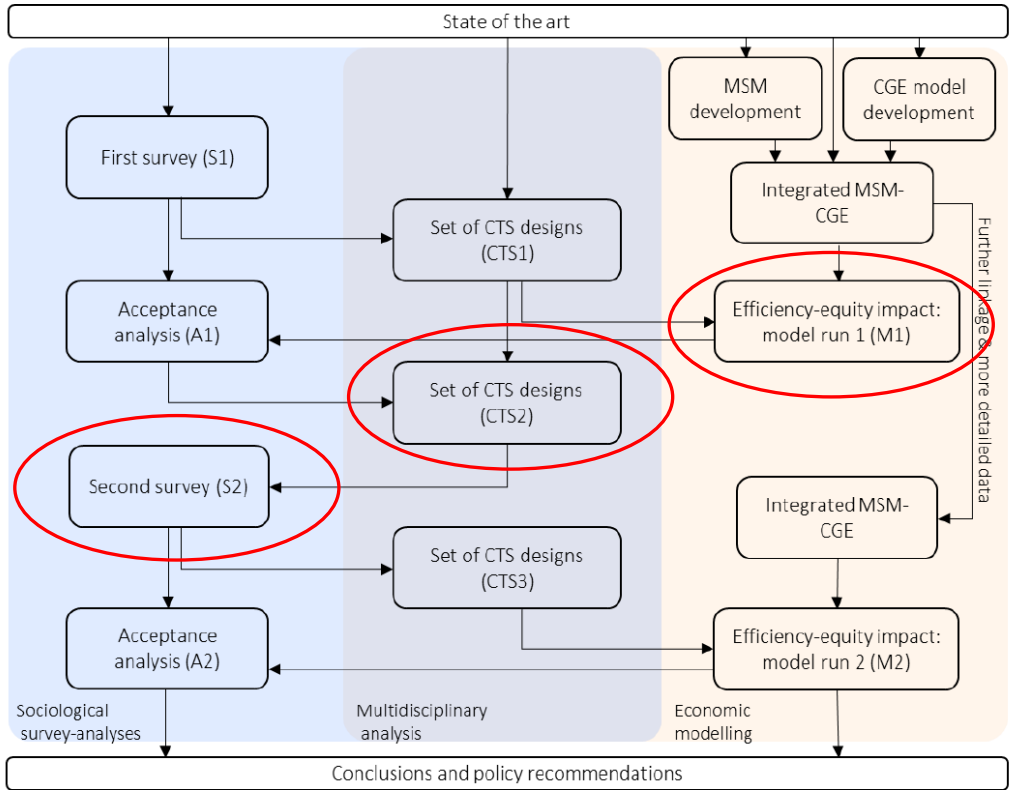
Agenda

- 14h15 – 15h00: FBP: “Does Climate Policy Reinforce Job Polarization: a CGE analysis” + Discussion
- 15h00 – 15h45: KULeuven, Dept. of Economics: “Distributional Effects of Climate Tax Shifts: Do General Equilibrium Effects Matter?” + Discussion
- 15h45 – 16h30: KULeuven, HIVA: “Seeking Common Ground? Acceptability of Carbon Pricing Policies in General and Accross Subgroups in Belgium” + Discussion

Pro memoria: project setup

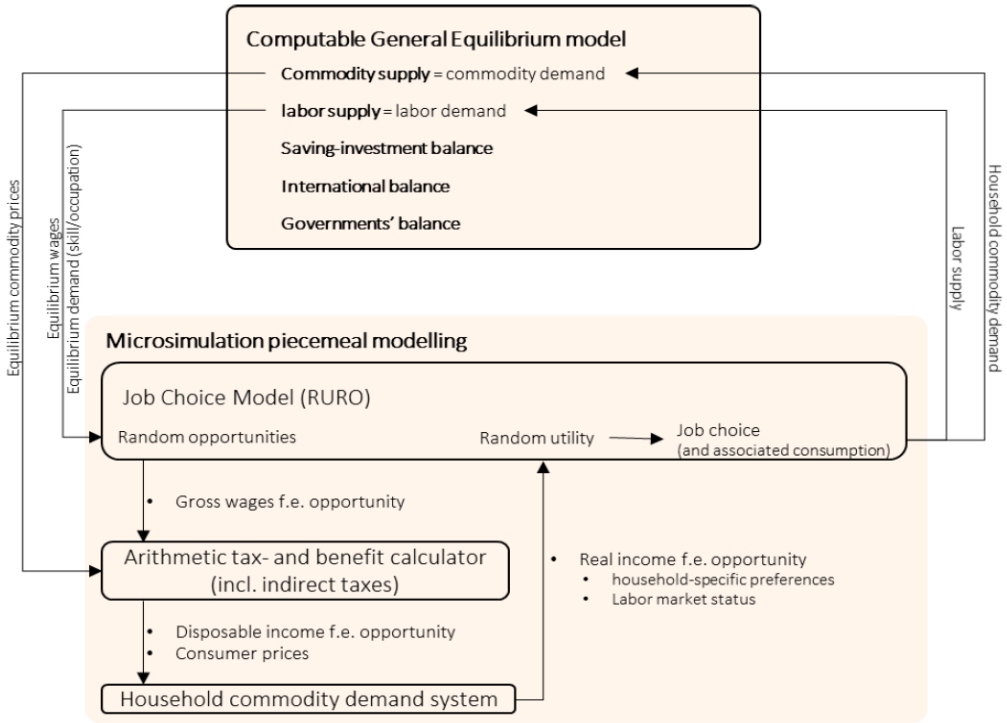
Project setup

- Estimating the distributional effects of climate tax shift designs (CTS)
- Using these results to gauging their acceptability through a survey
- Right now: integrating the economic models to do so
- Survey using these results due June ‘25



Economic modelling setup

- A CGE model, communicating prices, wages and profit rates
- To an MSM, mapping equity impacts, and communicating labour supply and consumption
- Step – wise integration: develop one-way CGE - > MSM link before integration
- These first results shown now



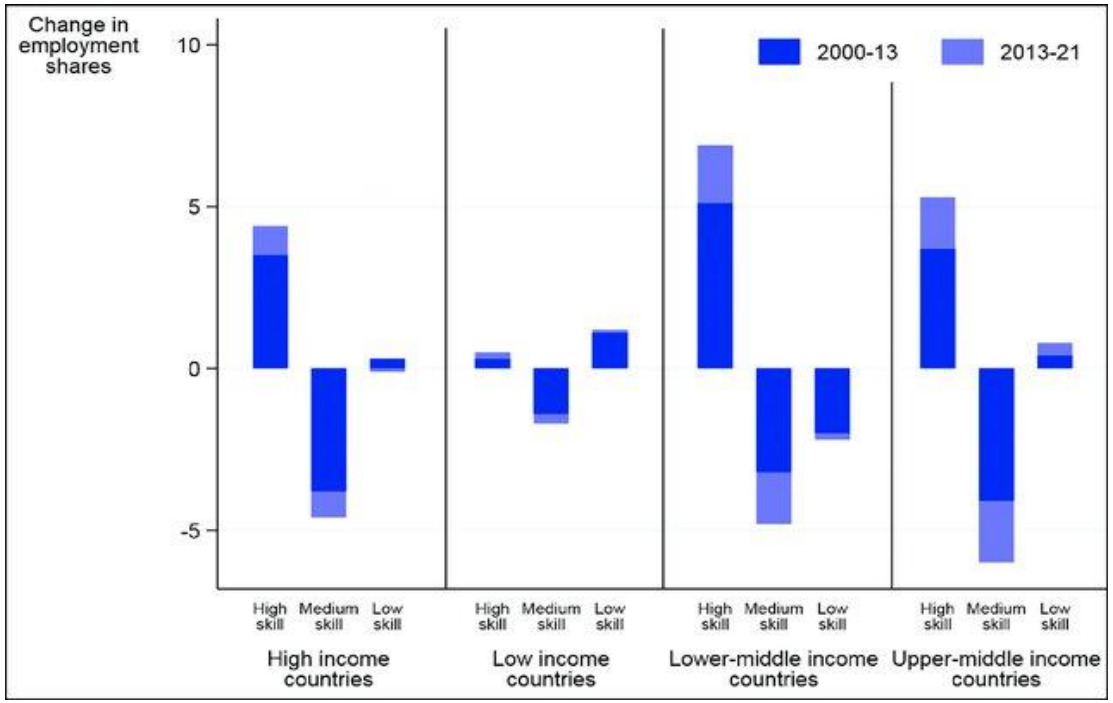
Does climate policy re-inforce job polarisation?

Alex Van Steenbergen

Joséphine Martiat

Job polarization - what is it?

- A worldwide trend
- Shifting allocation of tasks, away from medium skilled employees
- Impacting the wage distribution
  - ‘wage polarization’
  - Falling relative incomes of medium skilled
- With many causes
  - Automation
  - The China Shock
  - AI
  - Climate policy ?



Our research question and methodology

- Do standard climate tax shifts mimic the patterns of job / wage polarization?
  - With an economy – wide perspective
- Need to capture the interplay of labour demand, supply and resulting wages
- Computable General Equilibirum (CGE) model as the tool of choice
  - A machine that calculates prices – among which factor rewards
  - Equilibrating product, capital and labour markets
  - Which are the playground of optimizing consumers, producers, ...
  - Modern growth theory – inequality as a relative price

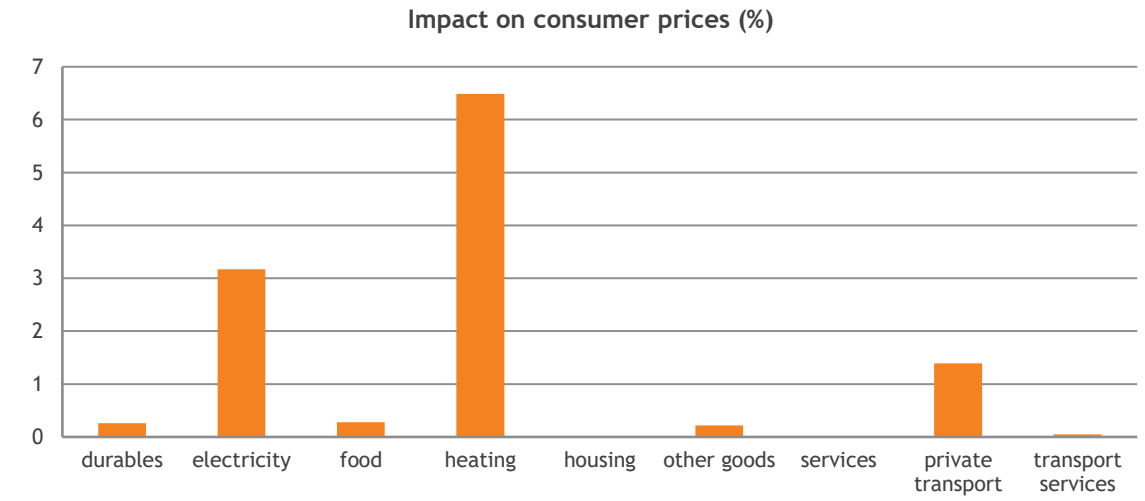
CGE – model setup

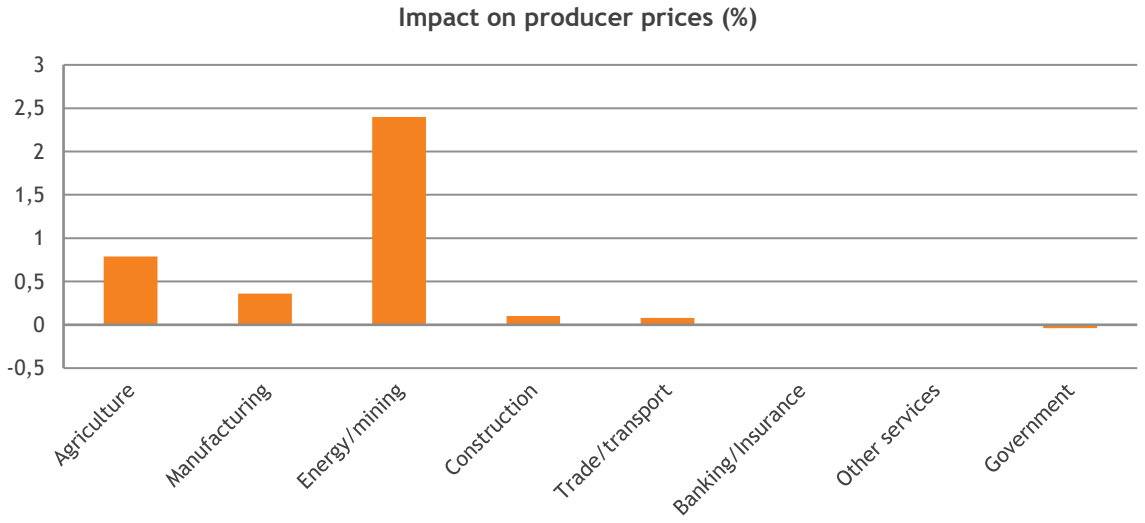
- Boeters & Feil (2009) – static, ‘medium run’
- 8 production sectors
  - 3 ‘dirty’ (agriculture, manufacturing, energy/mining)
  - 3 ‘clean’ (banking/insurance, other services and government)
  - 2 ‘ambivalent’ (construction, trade/transport)
- 3 labour skill types
  - low, medium, high
  - Supply labour on frictionless markets
- 1 capital good, partial elastic supply
- 9 consumption goods
  - Of which heating (gas/oil), electricity, private transport (uses fuel)
- National accounts of 2019

An example: a simple carbon tax scheme

Preliminary results

- The carbon tax
  - 25 euro per tonne
- The recycling scheme
  - A linear labour income tax cut
- Some first impacts
  - Ex – ante revenue: 2740 mEUR2019
  - Ex post tax cut: 0,75 pp
  - Ex post impact on consumer prices
  - Ex post impact on sectoral prices

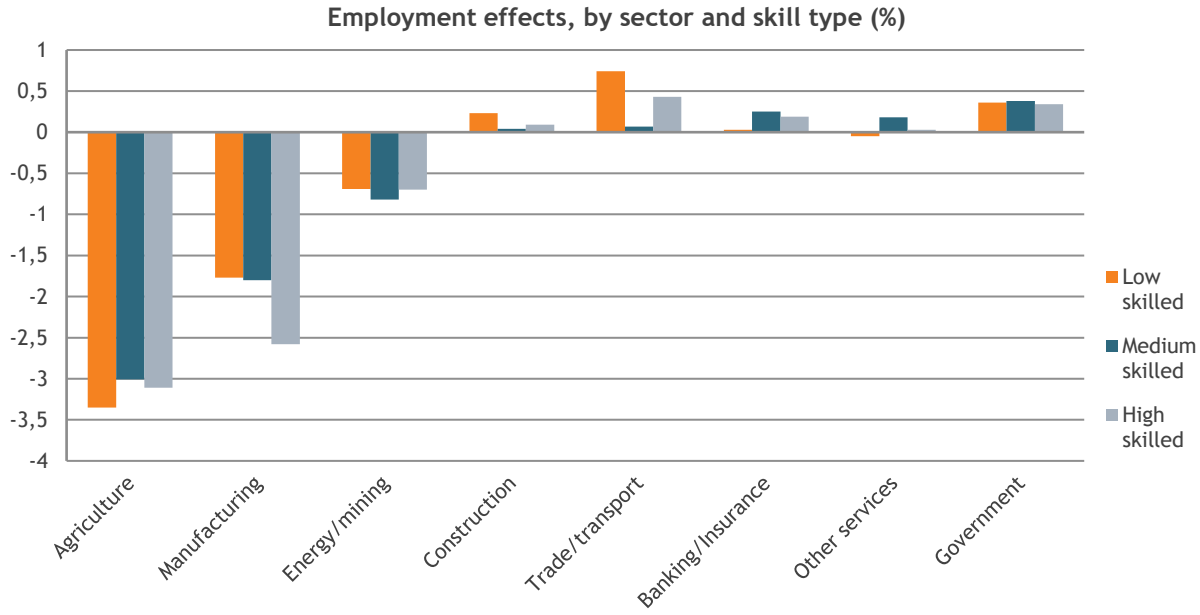


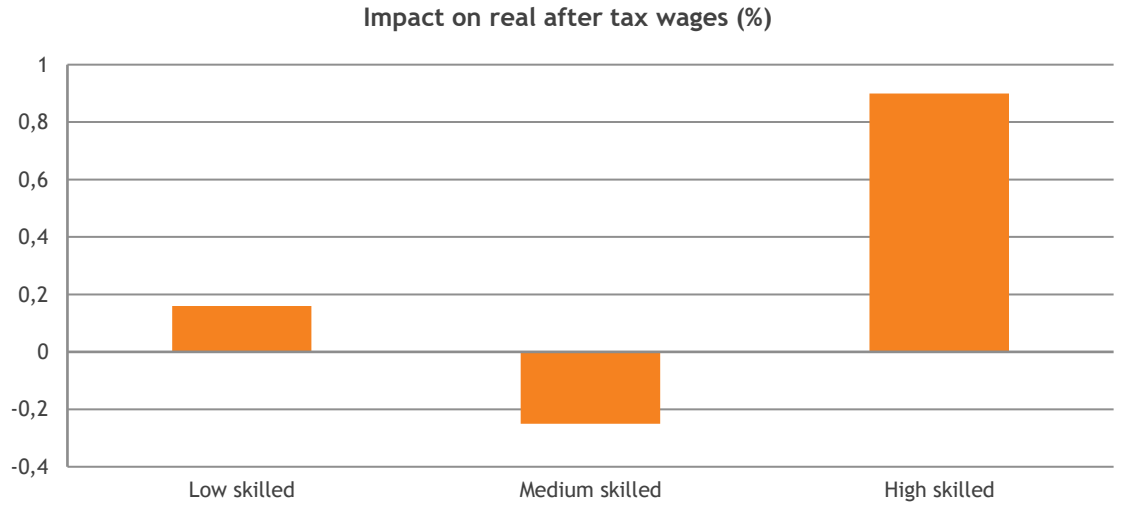


The main E4BEL effect – labour market re-adjustment

Preliminary results

- Labour demand
  - Losing sectors shed labour
  - Other sectors absorb labour
  - But need less ‘medium skills’ in their production process
- Pressure on medium skilled gross wages, compared to high skilled
  - Main result: medium skilled lose
  - Compensation through standard labour income tax recycling not sufficient
  - Survives extensive sensitivity analyis

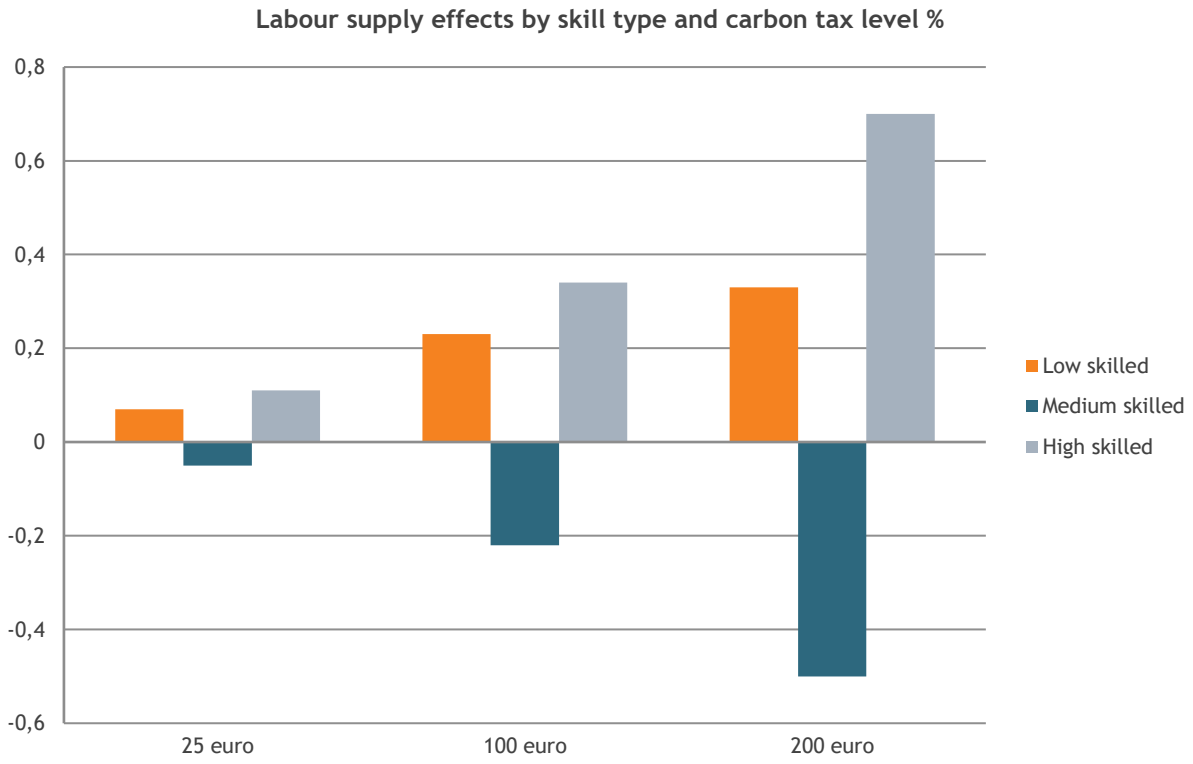




The main E4BEL effect – labour market re-adjustment

Preliminary results

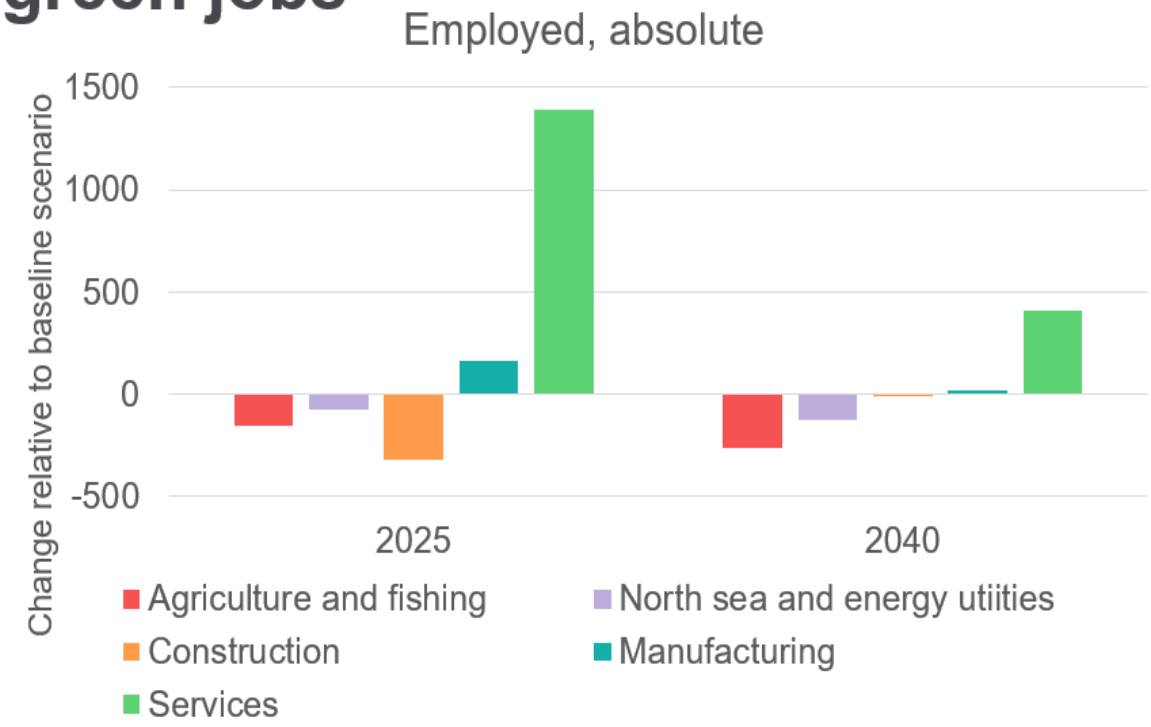
- Labour supply
  - Simple LS model (Quasi - Linear)
  - Total wage elasticities from MSM
  - Low skilled: +0,45%
  - Medium skilled: +0,20%
  - High skilled: +0,12%
- Job – polarisation, reproduced
  - Expansion low & high, loss medium
  - Positive function of size carbon tax shift



Qualification 1: the investment decision

- Emission abatement through investment absent
- Needs a dynamic model, with necessary behaviour
- What might such a model say?
  - If agents anticipate a future CTS, a temporary inv/job bump possible
  - If they deem inv profitable, to escape carbon tax
  - But still ‘servicisation’

Change in sector composition and green jobs



Qualification 2: the labour market

- A competitive labour market, without frictions
  - Choice with a view to CGE – MSM linking
- Instantaneous movement of skill types across sectors
  - But what if jobs differ, for the same skill?
- An investigation using the labour force survey
  - Does the job content of low/medium/high skilled labour differ across sectors?

Measuring job content : occupations versus tasks

4 occupational groups (Marin and Vona (2019), based on ISCO)

- Managers and Professionals
- Technicians
- Service and Administrative workers
- Manual workers

5 task types (Autor, Levy and Murnane (2003), based on Mihaylov and Tijdens (2019))

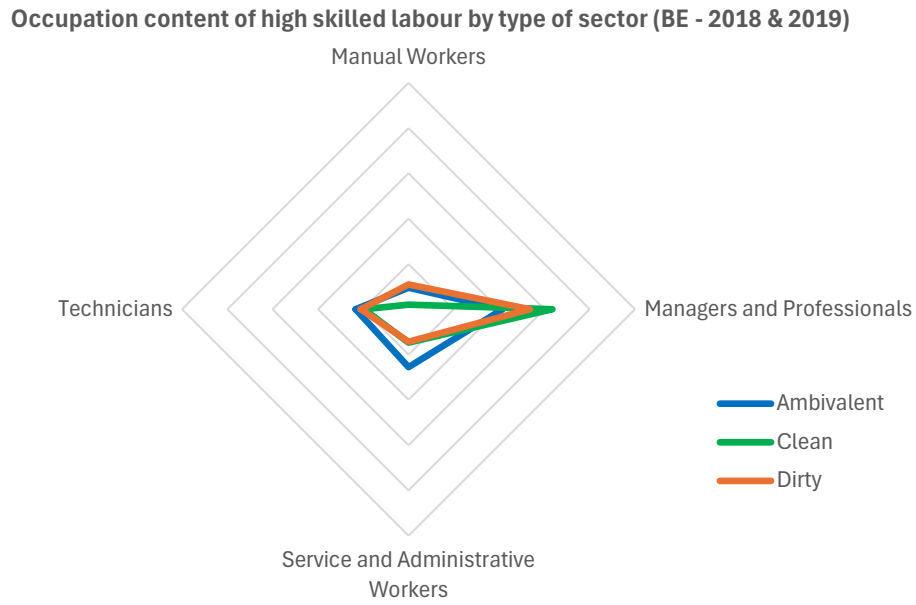
- Non-Routine Cognitive
  - Non-Routine Analytical
  - Non-Routine Interactive
- Non-Routine Manual
- Routine Manual
- Routine Cognitive

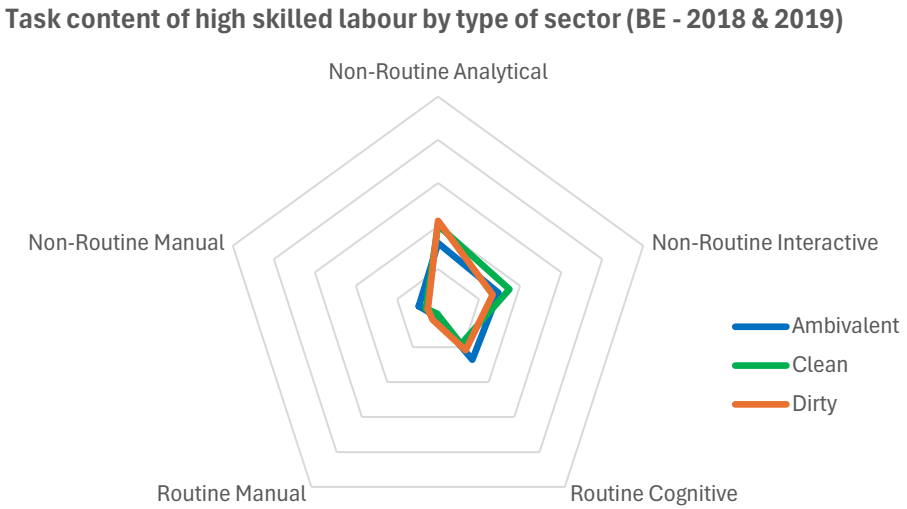
Preliminary results

The content of high skilled jobs

- Similar job content in ‘dirty’ & ‘clean’ sectors
- For both ‘occupation’ and ‘task’ measure

➔ Suggest relatively easy mobility

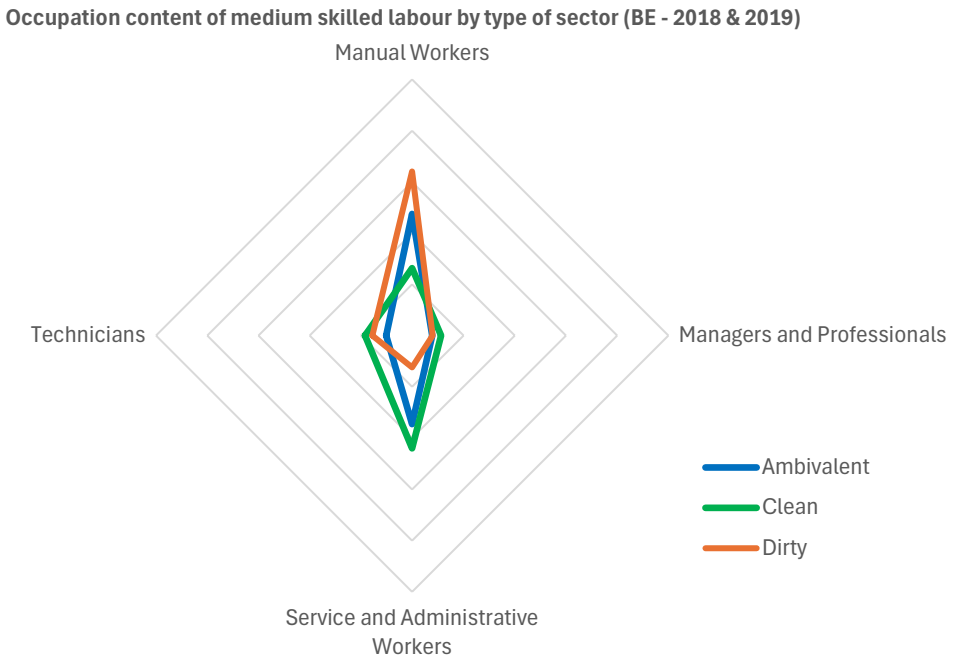




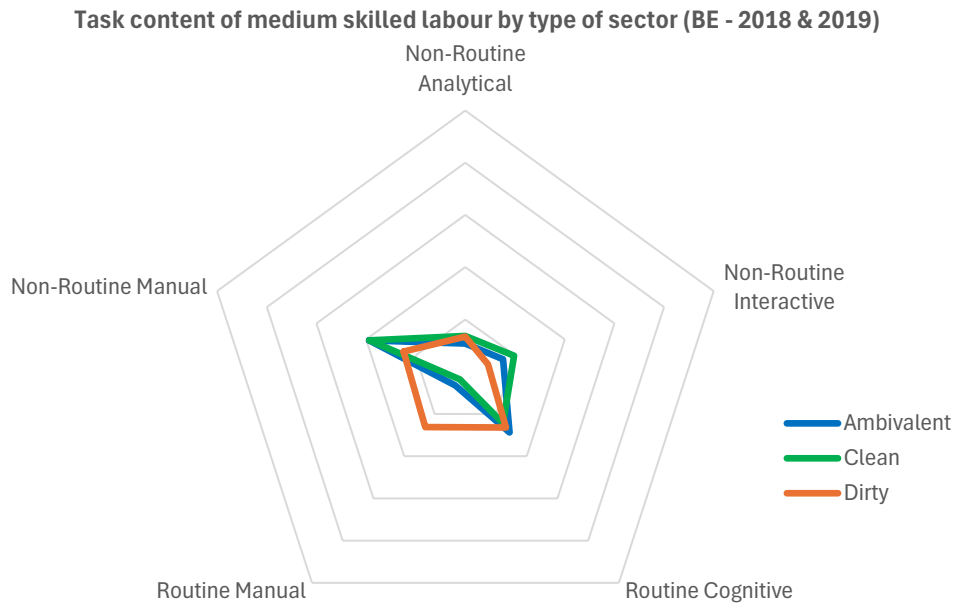
The content of medium skilled jobs

Preliminary results

Differences in job content of medium skilled labour across sectors:



Less manual, more service and administrative jobs in 'clean' sector



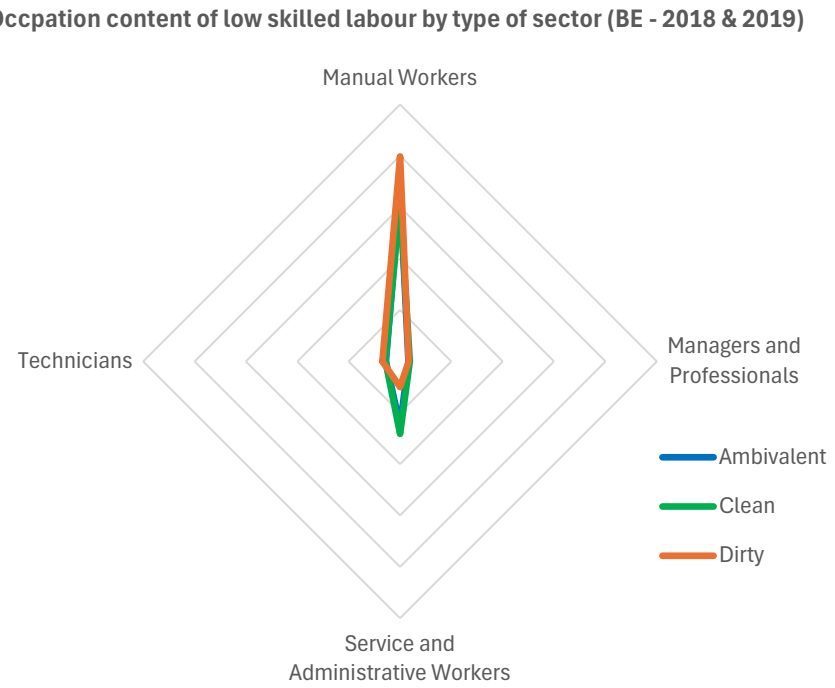
Less routine manual, more non-routine manual and interactive in 'clean' sector

➔ Suggest high risk of mismatch

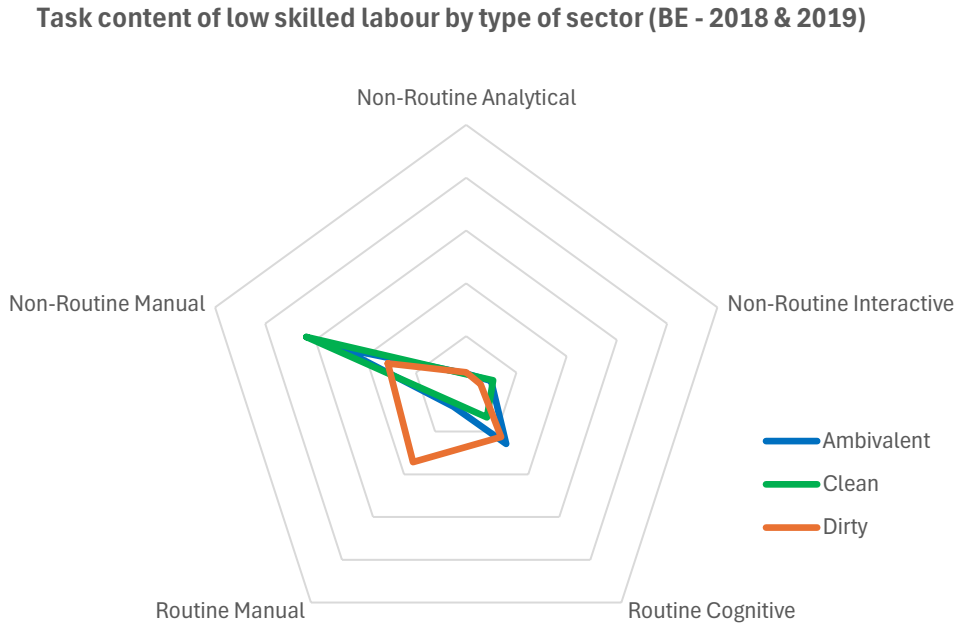
The content of low skilled jobs

Preliminary results

Differences in job content of low skilled labour across sectors:



No big difference in the occupation content



More non-routine labour in clean sector

➔ Suggests mismatch in task content

Conclusion, going forward

- Standard carbon tax shifts tend to re-inforce job – polarization
  - Can non-standard tax shifts be designed (and modelled)?

- Labour demand elasticities are important, but do not overturn the main result
  - Medium skilled labour most at risk, high skilled least

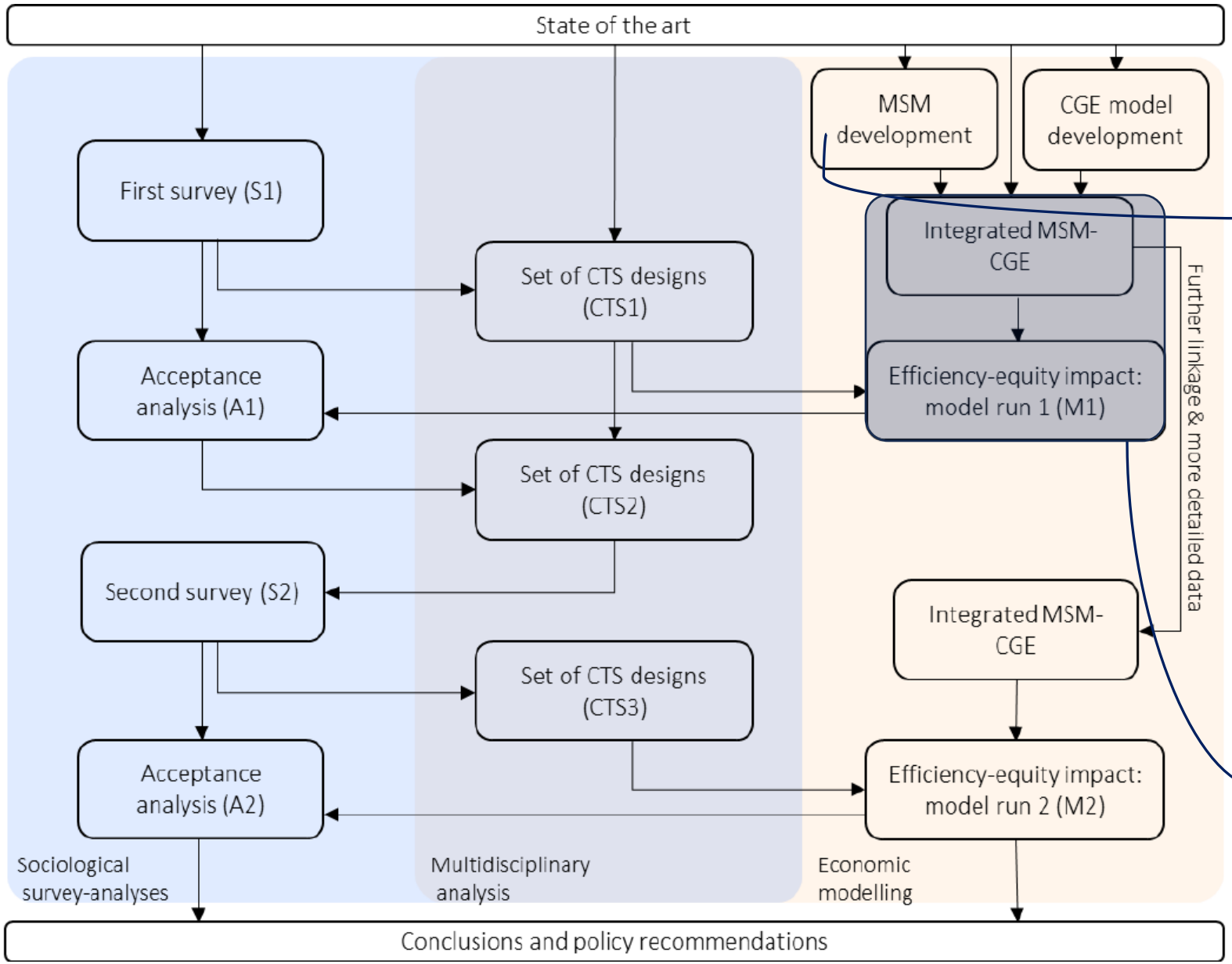
- The importance of frictions
  - First candidate for second modelling run
  - Empirical work : elaborate content of different low/medium skilled jobs?

Timing, past and future

WP's and tasks:	2023				2024				2025				2026			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
WP1: State of the art			✓													
WP3: CGE Model, data and estimation																
Task 3.1 B and D labour market data									✓							
Task 3.2 Labour demand estimation																
Task 3.3. First CGE model									✓							
Task 3.4. Second CGE model																
WP4: integration CGE and MSM																
Task 4.1 Initial versions									(✓)							
Task 4.2 Final versions																
WP6: Policy design/simulations																
Task 6.1 First set of scenarios										(✓)						
Task 6.2 second set of scenarios																

E4BEL steering committee
4/2/2025

1. **Progress in project**
2. Top-down approach: Do GE-effects matter?
3. Planning



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Sage Journals

Regular Submission

Piecemeal Modeling of the Effects of Joint Direct and Indirect Tax Reforms

Bart Capéau [1,2], André Decoster [2], and Stijn Van Houtven [2]

Abstract

In this article, we elicit the assumptions needed for an assessment of a joint reform of personal income and indirect taxes in a consistent conceptual framework. One often lacks an encompassing model for both labor supply decisions in real world tax and benefit contexts and the allocation of disposable income to commodities. We characterize households' labor supply decisions by a random utility random opportunity model of job choice. We illustrate the framework with a Belgian tax reform proposal that shifts the burden away from labor taxes to indirect taxation. We find substantial empirical evidence that, both from a distributional and from a budgetary perspective, it is important to account for the impact of indirect taxes on the labor supply decision of households. The cost recovery effects of the tax shift are negative. This is, among other things, explained by the income effect in our job choice model.

Keywords

job choice, labor supply, tax reform, joint direct and indirect tax reform, microsimulation

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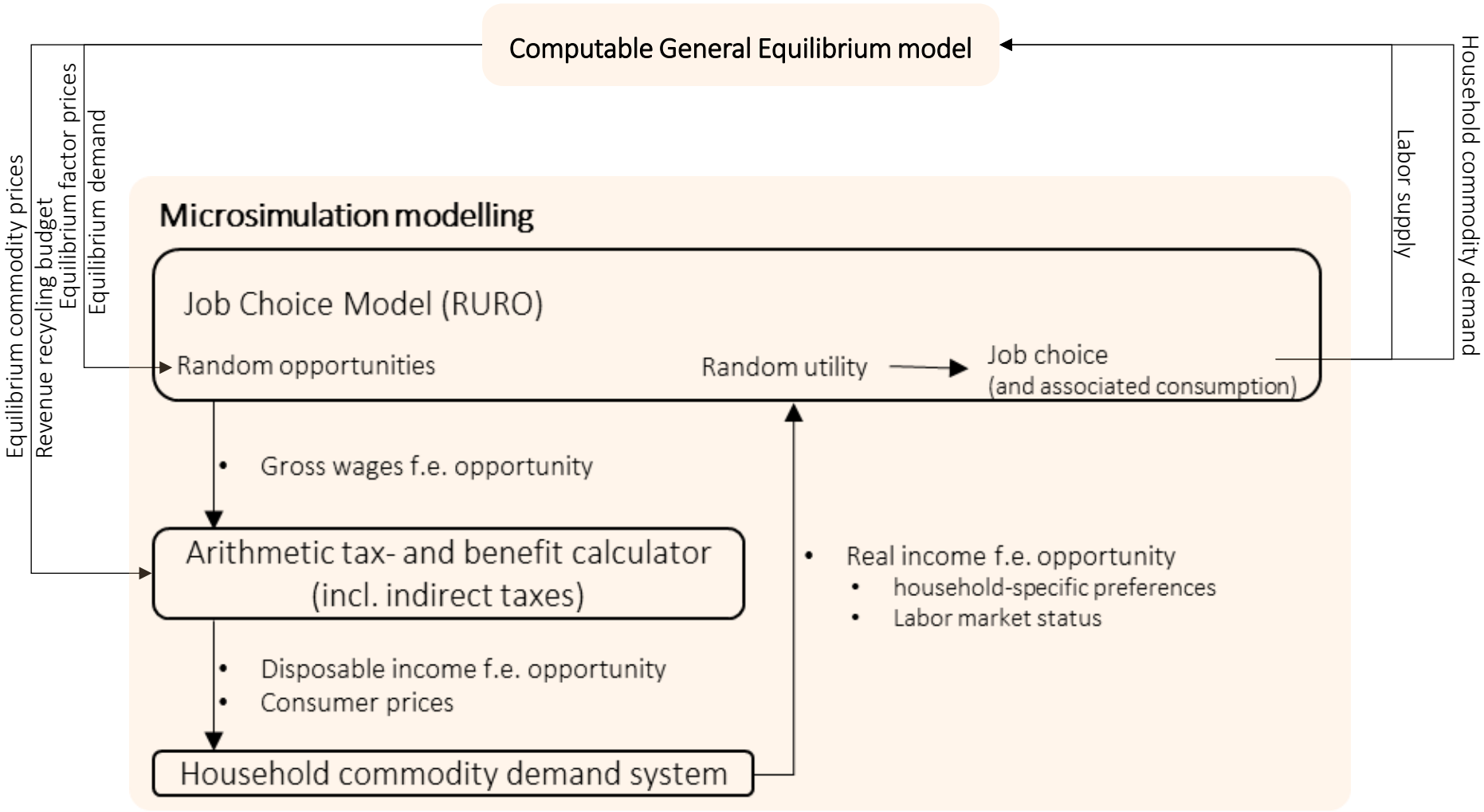
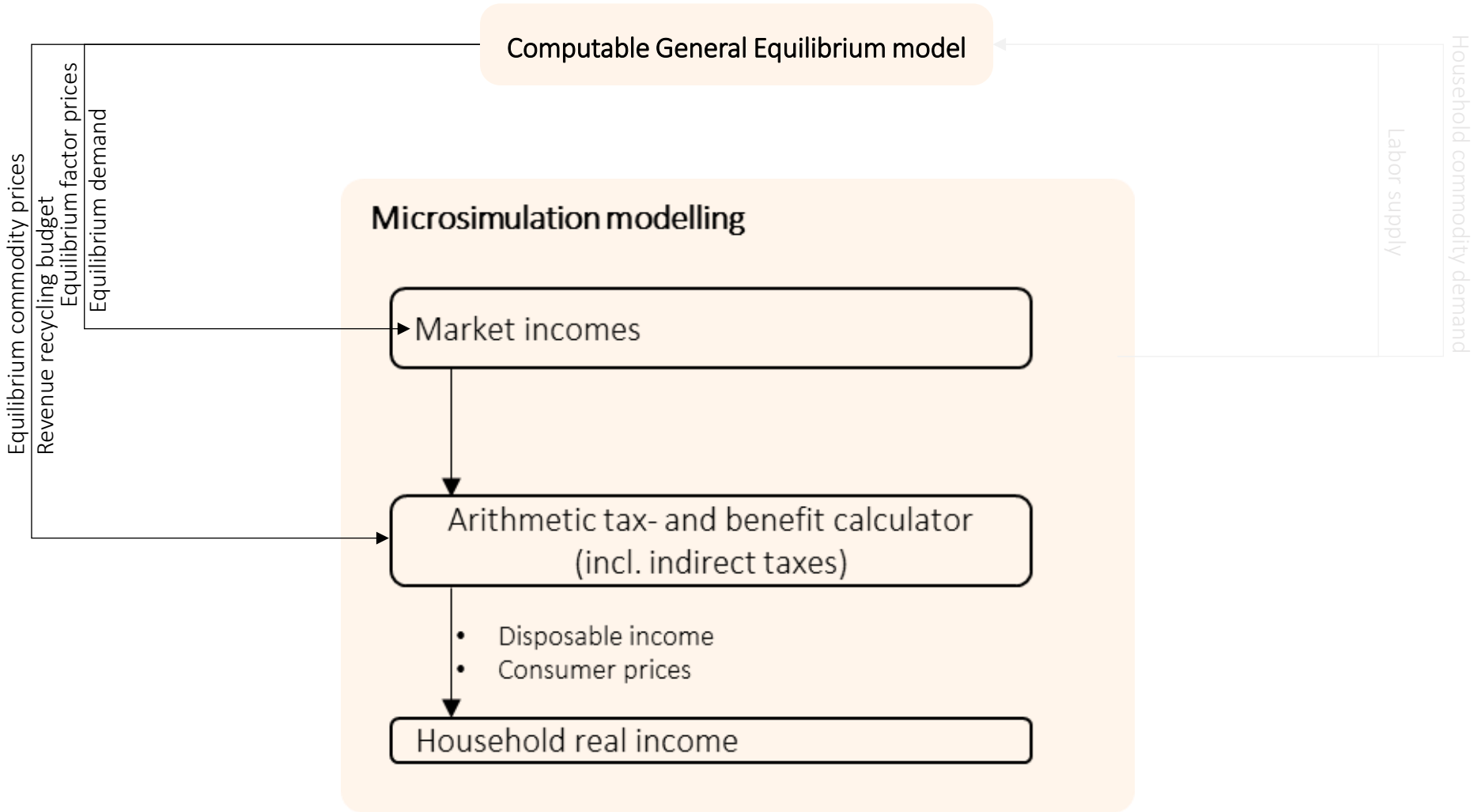
Presentation today


Computable General Equilibrium model
Equilibrium commodity prices
Revenue recycling budget
Equilibrium factor prices
Equilibrium demand
Labor supply
Household commodity demand
Microsimulation modelling
Job Choice Model (RURO)
Random opportunities
Random utility
Job choice
(and associated consumption)
Gross wages f.e. opportunity
Arithmetic tax- and benefit calculator
(incl. indirect taxes)
Real income f.e. opportunity
household-specific preferences
Labor market status
Disposable income f.e. opportunity
Consumer prices
Household commodity demand system


Computable General Equilibrium model
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Household commodity demand
Labor supply
Microsimulation modelling
Market incomes
Arithmetic tax- and benefit calculator
(incl. indirect taxes)
Disposable income
Consumer prices
Household real income

1. Progress in project
2. **Top-down approach: Do general equilibrium effects matter?**
3. Planning

- Top-down approach: Do GE-effects matter? (Vandyck et al. 2024)
  - Model shock in CGE
  - Use output in CGE to change microdataset
  - Distributional impact on real income

➢ Do GE-effects change the distributional impact of CTS?
  ➢ Relate traditional day-after arithmetic MSM result with CGE result
  ➢ Model different stages of economic adjustment to CTS introduction

➢ Consistency check and alignment of CGE and MSM on multiple dimensions
  ➢ Consistency in the baseline (macro-aggregates, consumption shares, tax parameters)
  ➢ Labor supply elasticities from estimated RURO model
  ➢ Understand CGE mechanisms and how to translate to microdata

Computable general equilibrium

- Households
  - Three types of labor (low, medium, high skilled)
    - Quasi-linear labor supply
    - Wage bill & tax rates calibrated with MSM
  - Capital (incl. independents)
    - Partially elastic supply (WorldScan model)
  - Pension
    - Only benefits
  - Traditional nested CES demand functions

- Firms
  - Non-nested CES demand function (Boeters & Feil 2009)

- Government, International trade, capital mobility

Microsimulation model

- Euromod, extended with Indirect Taxes
- EU-SILC 2019 with imputed expenditures from HBS 2018

Aligning macro and micro

- Check macro-aggregates: income, consumption and taxes
  - Undercoverage of consumption in micro
  - Undercoverage of capital incomes (incl. mixed income)

    -> distribute macro aggregate (in future: utilize HFCS)

- Tax rates from microlevel, by skill-level
- Total elasticities of labor supply from microlevel, by skill-level
  - Input for CGE (one margin)
  - Employment changes modelled on intensive and extensive margin on microlevel
- Budget shares from microlevel, by skill-level

Shock: Broad carbon price of 25 euro per tonne

Revenue recycling: Proportional labor tax rate reduction (ssc)

➢ And compare with revenue recycling with a lump sum carbon dividend

Outcome of CGE translated in micromodel

- Consumption prices
- Factor incomes (wages and rate of return)
- Employment change by type
  - Split in intensive and extensive margin based on RURO-elasticities
- Budget for revenue recycling depends on macrolevel
- Numéraire: CPI-basket (CPI=1) (Equilibrium is characterized by relative prices)

Compare to day-after impact of CTS in household sector

- Only carbon price on emissions of households
- Revenue recycling on respective budget
- No behavioral changes

We show impact on real income: $^{y}/_{\mathrm{P}}$ (Laspeyres index $\mathrm{P} = \sum wp$)

$$\frac{\Delta\frac{y}{\mathrm{P}}}{\frac{y^0}{\mathrm{P}^0}} = \frac{\frac{R}{\mathrm{P}^1}}{y^0} + \left(\frac{\frac{y^1 - R}{\mathrm{P}^1} - y^0}{y^0}\right) \qquad \text{with } (\mathrm{P}^0 = 1)$$

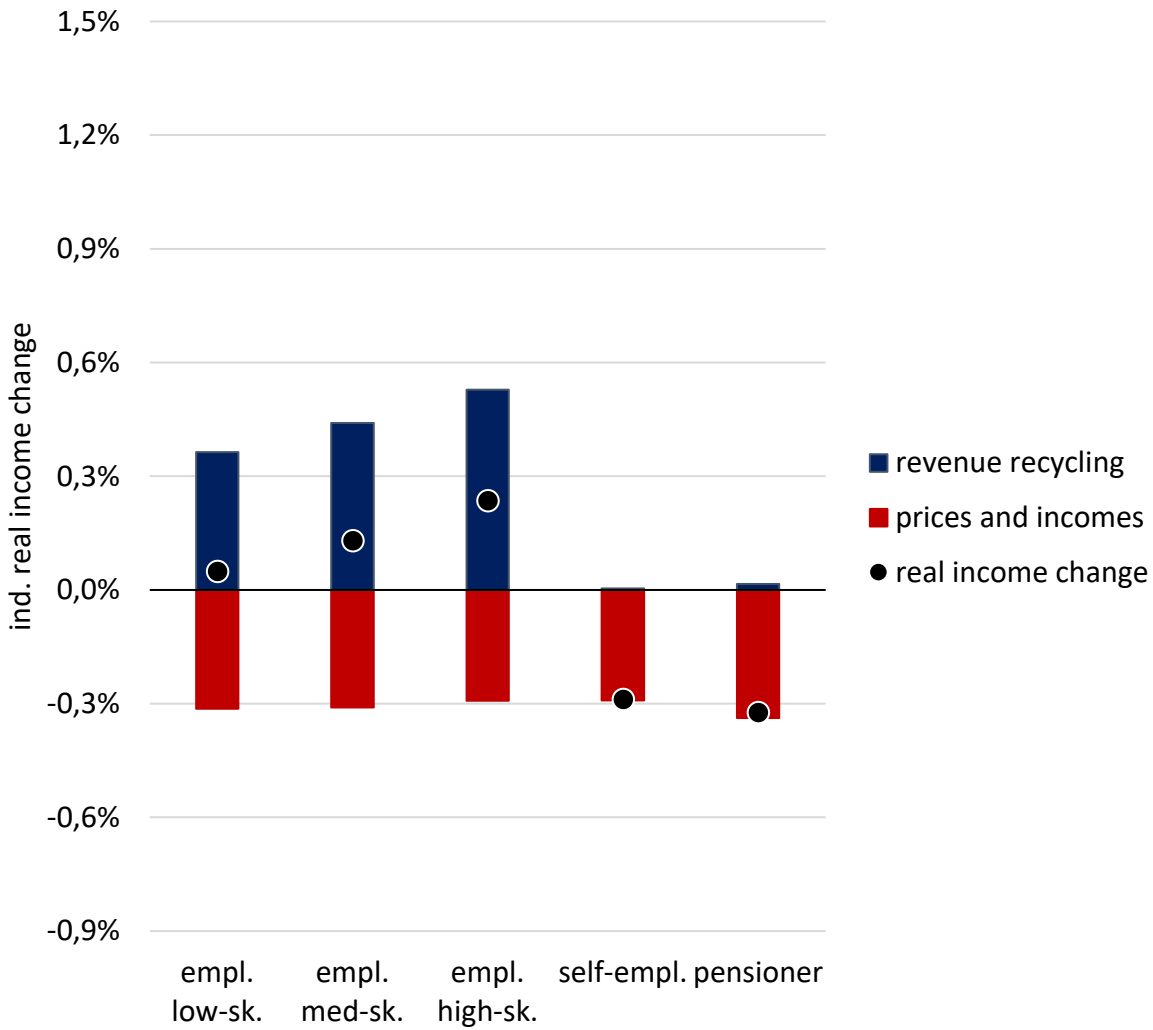
Impact of price changes and income changes, excluding revenue recycling, on real income

Real effect of revenue recycling

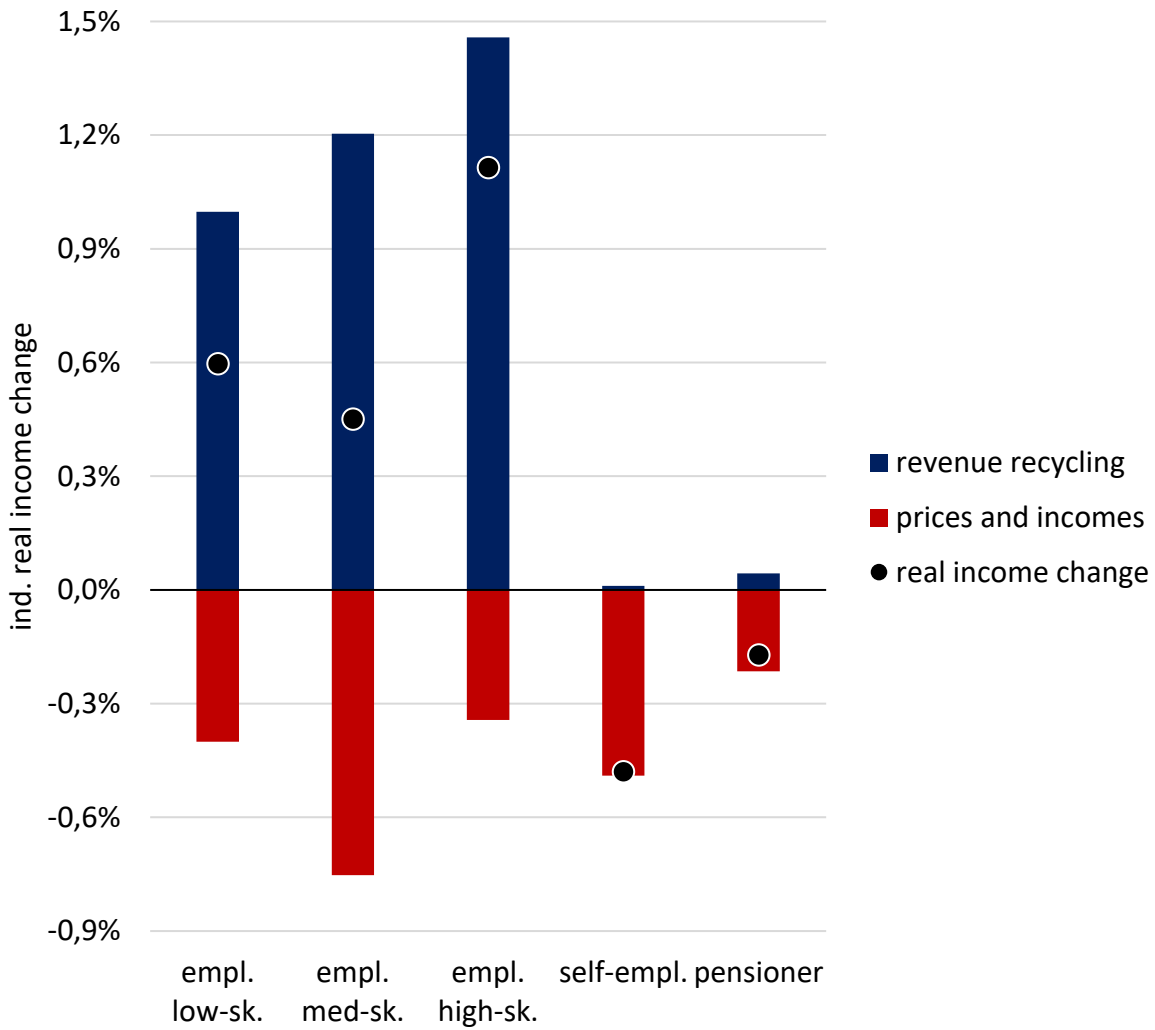
- Independent of choice of the numéraire
- Price and income changes not disentangled (not meaningful in GE-setting)

Preliminary results

Day-after impact of CTS in household sector

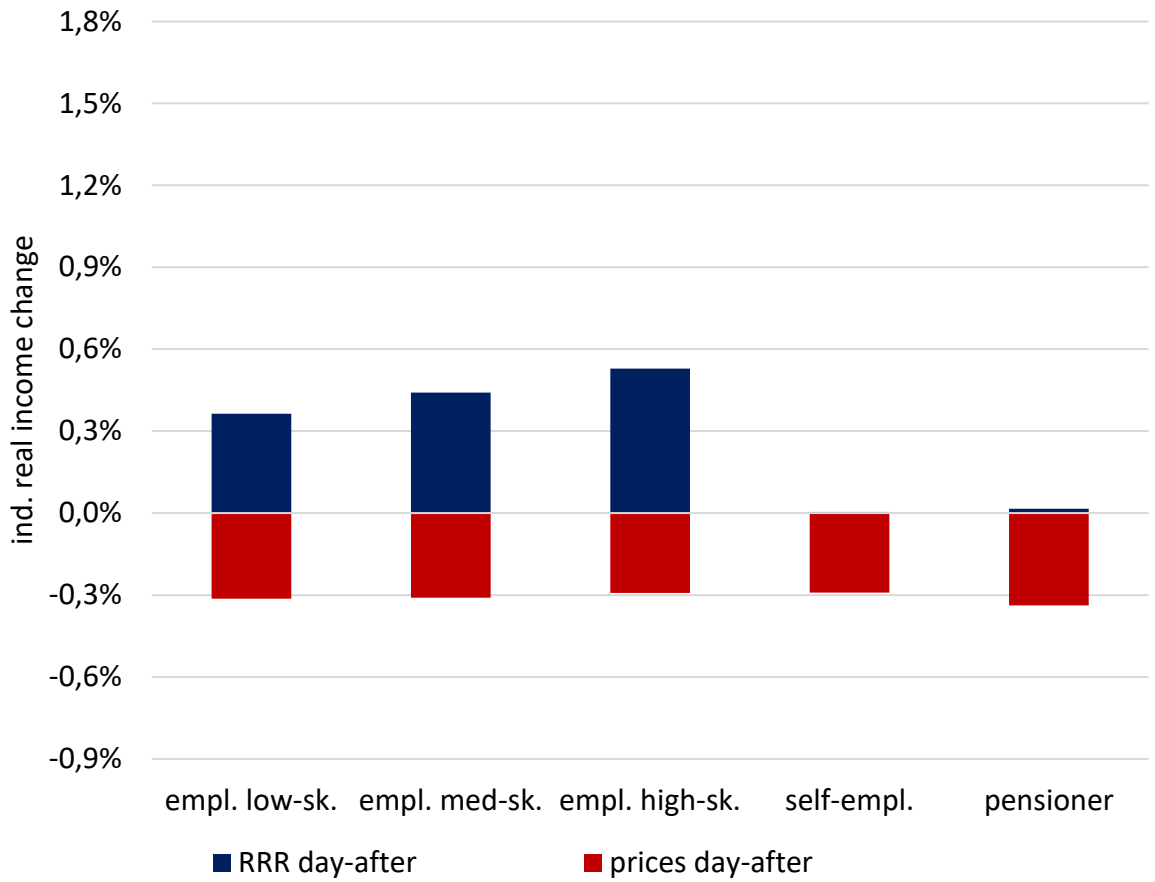


GE-impact of CTS



Preliminary results

Decomposition of GE-impacts of CTS



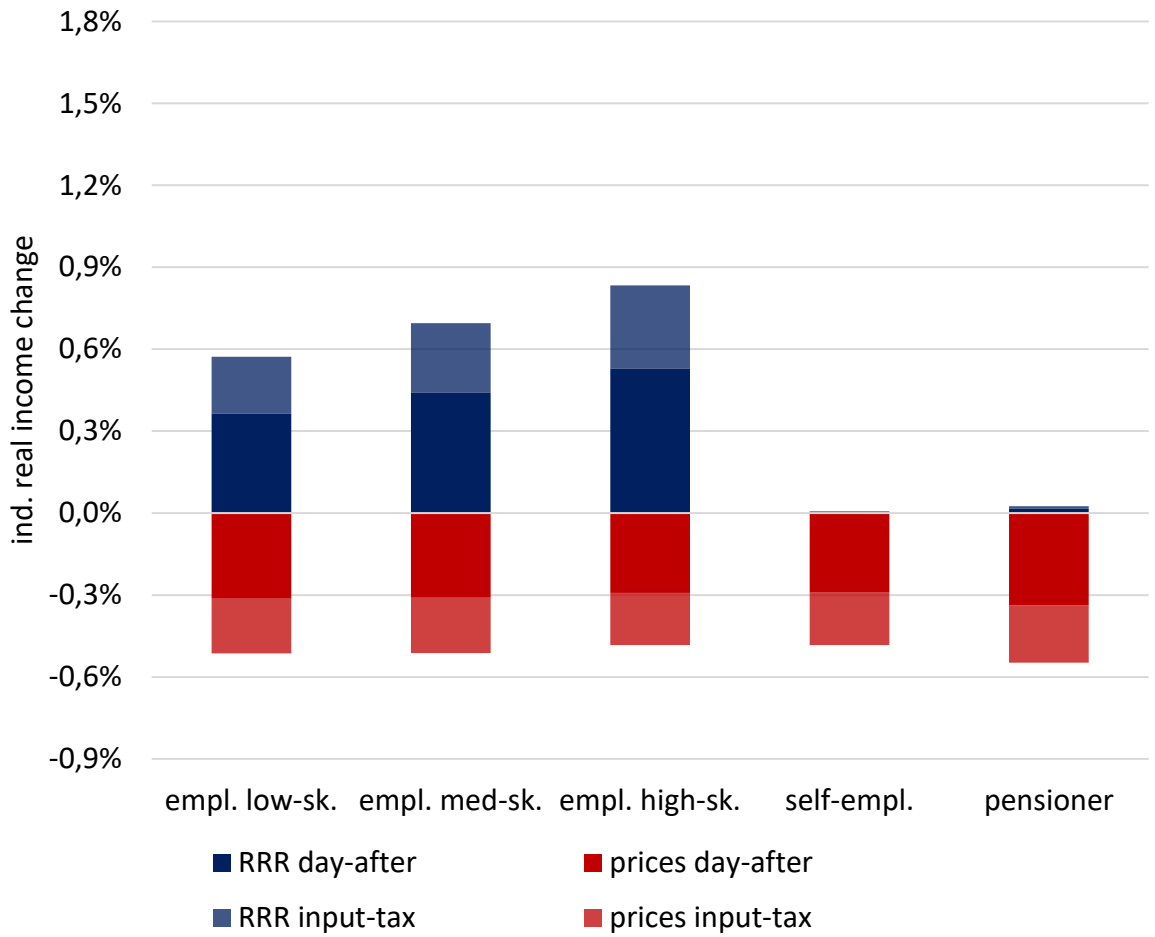
1. Day-after CTS households

Change in:

CPI	+0,28%
price of heating	+6,43%
price of private transport	+1,27%
price of electricity	
price of services	
price of other goods	
wage low-sk.	
wage medium-sk.	
wage high-sk.	
hours low-sk.	
hours medium-sk.	
hours high-sk.	
rate of return	
tax rate (p.p. change)	-0,31p.p.

Preliminary results

Decomposition of GE-impacts of CTS



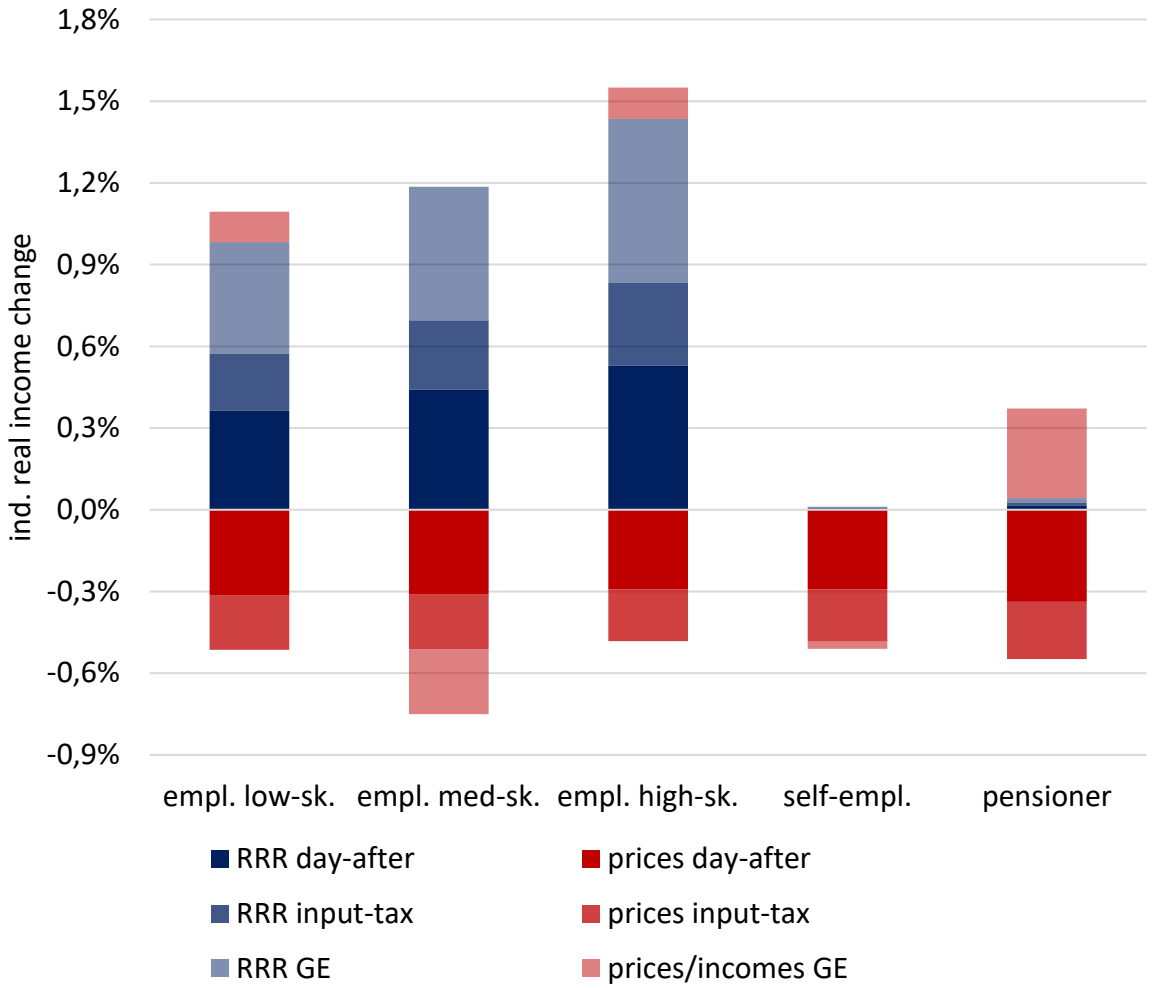
2. Additional impact taxes on production

Change in:

CPI	+0,45%
price of heating	+6,58%
price of private transport	+1,37%
price of electricity	+2,68%
price of services	+0,04%
price of other goods	+0,16%
wage low-sk.	
wage medium-sk.	
wage high-sk.	
hours low-sk.	
hours medium-sk.	
hours high-sk.	
rate of return	
tax rate (p.p. change)	-0,49p.p.

Preliminary results

Decomposition of GE-impacts of CTS



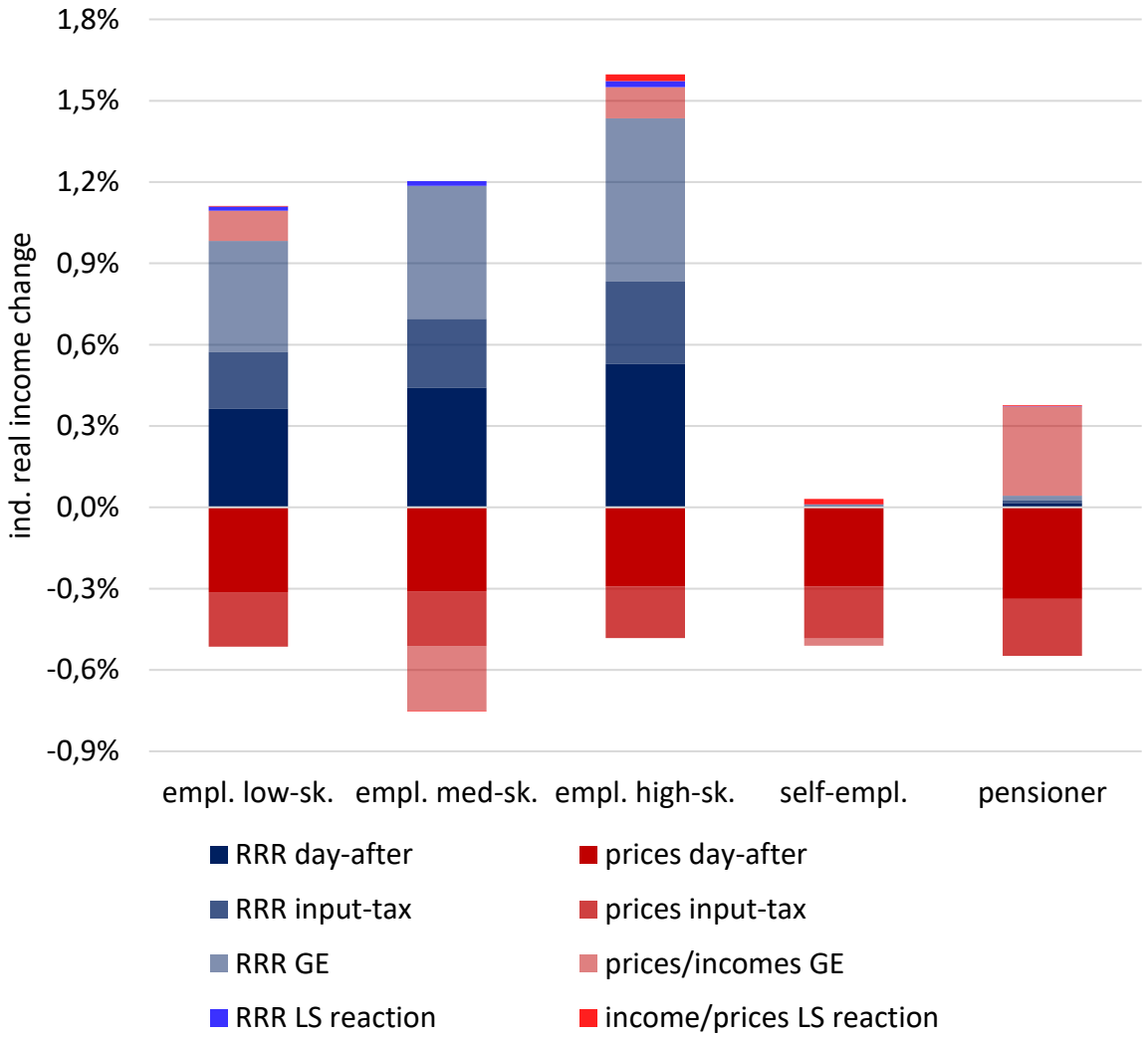
3. GE price and income adjustment

Change in:

CPI	0,00%
price of heating	+6,01%
price of private transport	+0,92%
price of electricity	+2,68%
price of services	-0,47%
price of other goods	-0,25%
wage low-sk.	-0,79%
wage medium-sk.	-1,35%
wage high-sk.	-0,51%
hours low-sk.	
hours medium-sk.	
hours high-sk.	
rate of return	-0,48%
tax rate (p.p. change)	-0,84p.p.

Preliminary results

Decomposition of GE-impacts of CTS



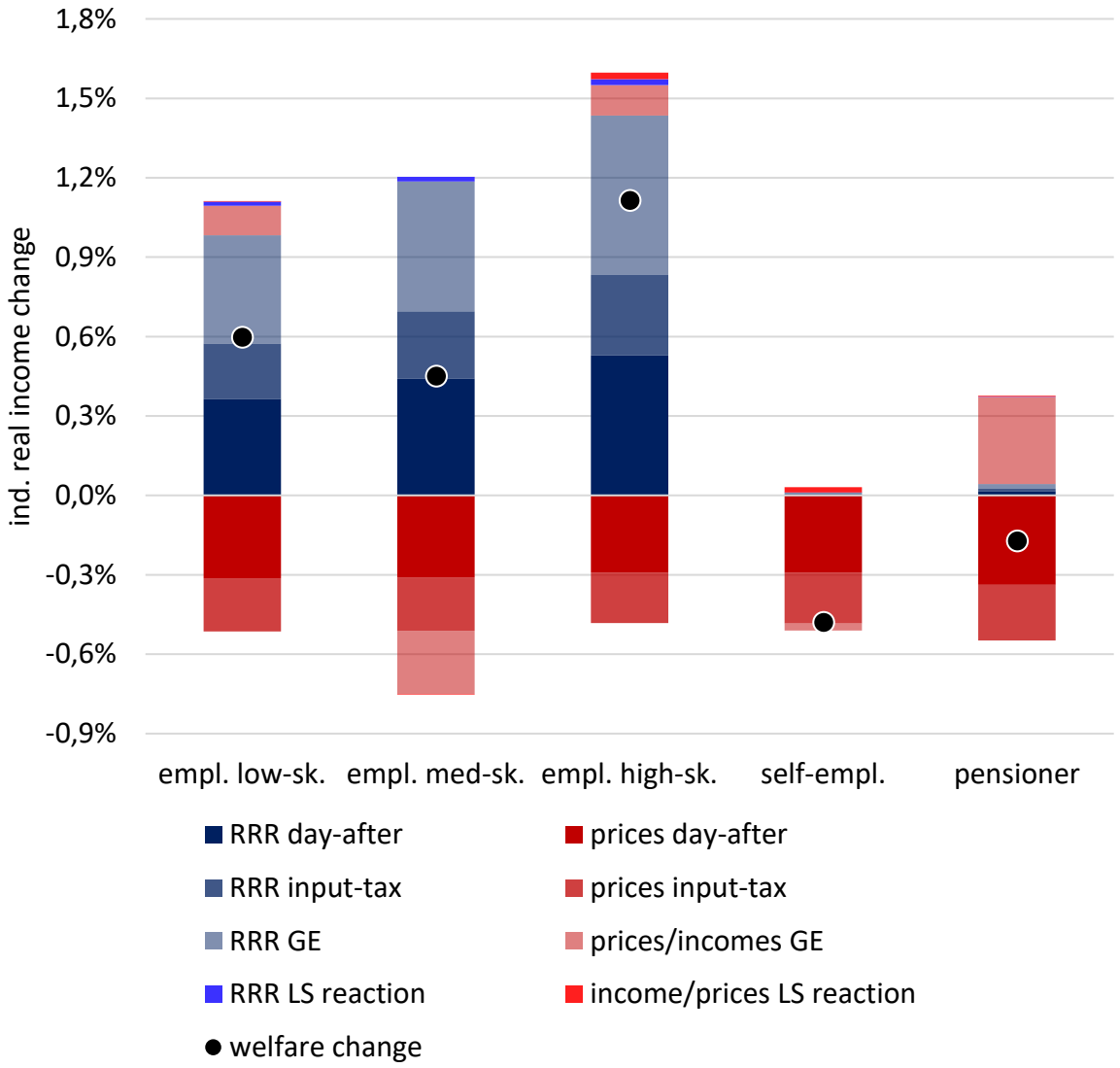
4. Labor supply change

Change in:

CPI	0,00%
price of heating	+6,01%
price of private transport	+0,92%
price of electricity	+2,68%
price of services	-0,47%
price of other goods	-0,25%
wage low-sk.	-0,79%
wage medium-sk.	-1,35%
wage high-sk.	-0,51%
hours low-sk.	+0,07%
hours medium-sk.	-0,05%
hours high-sk.	+0,11%
rate of return	-0,46%
tax rate (p.p. change)	-0,85p.p.

Preliminary results

Decomposition of GE-impacts of CTS



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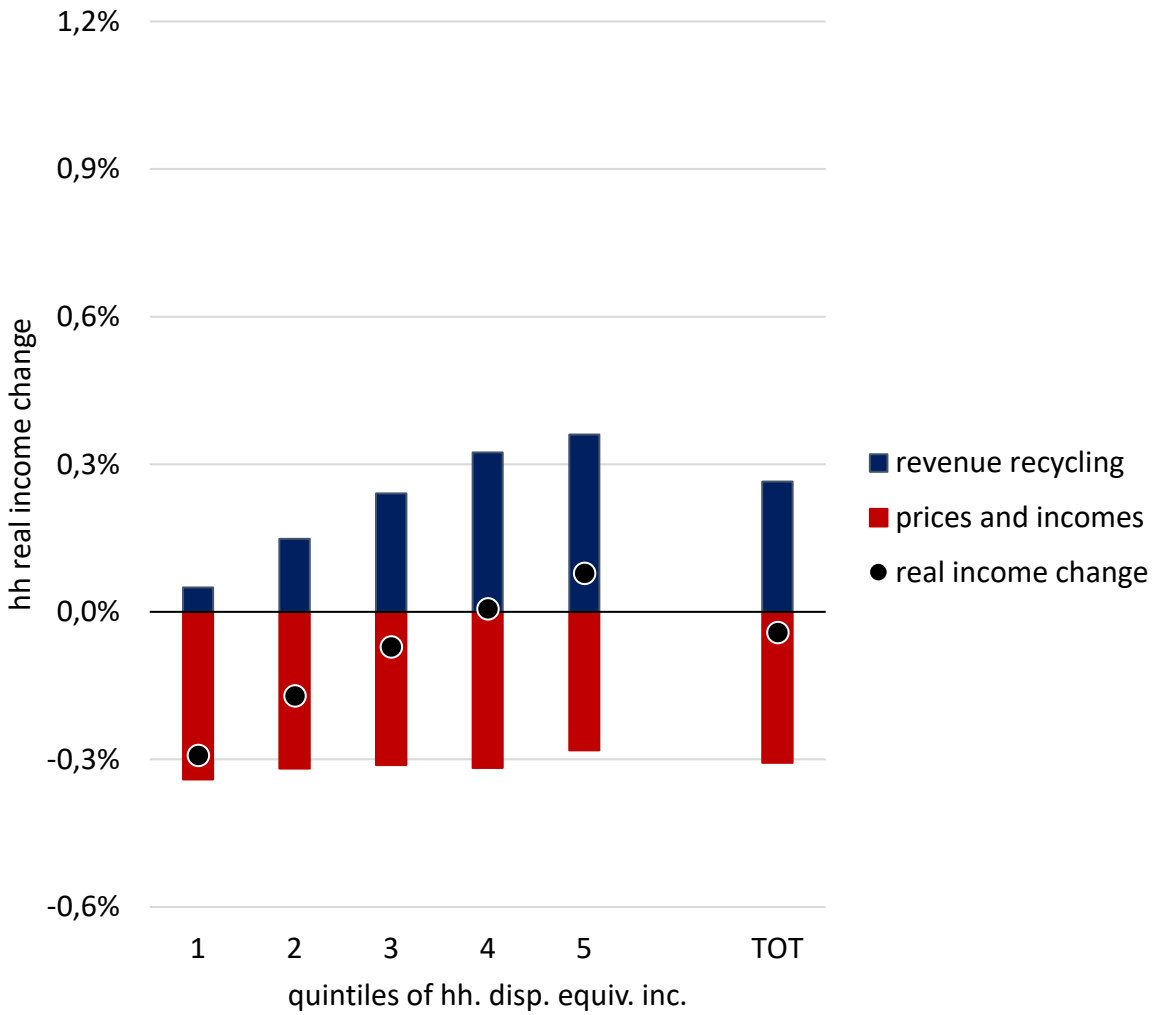
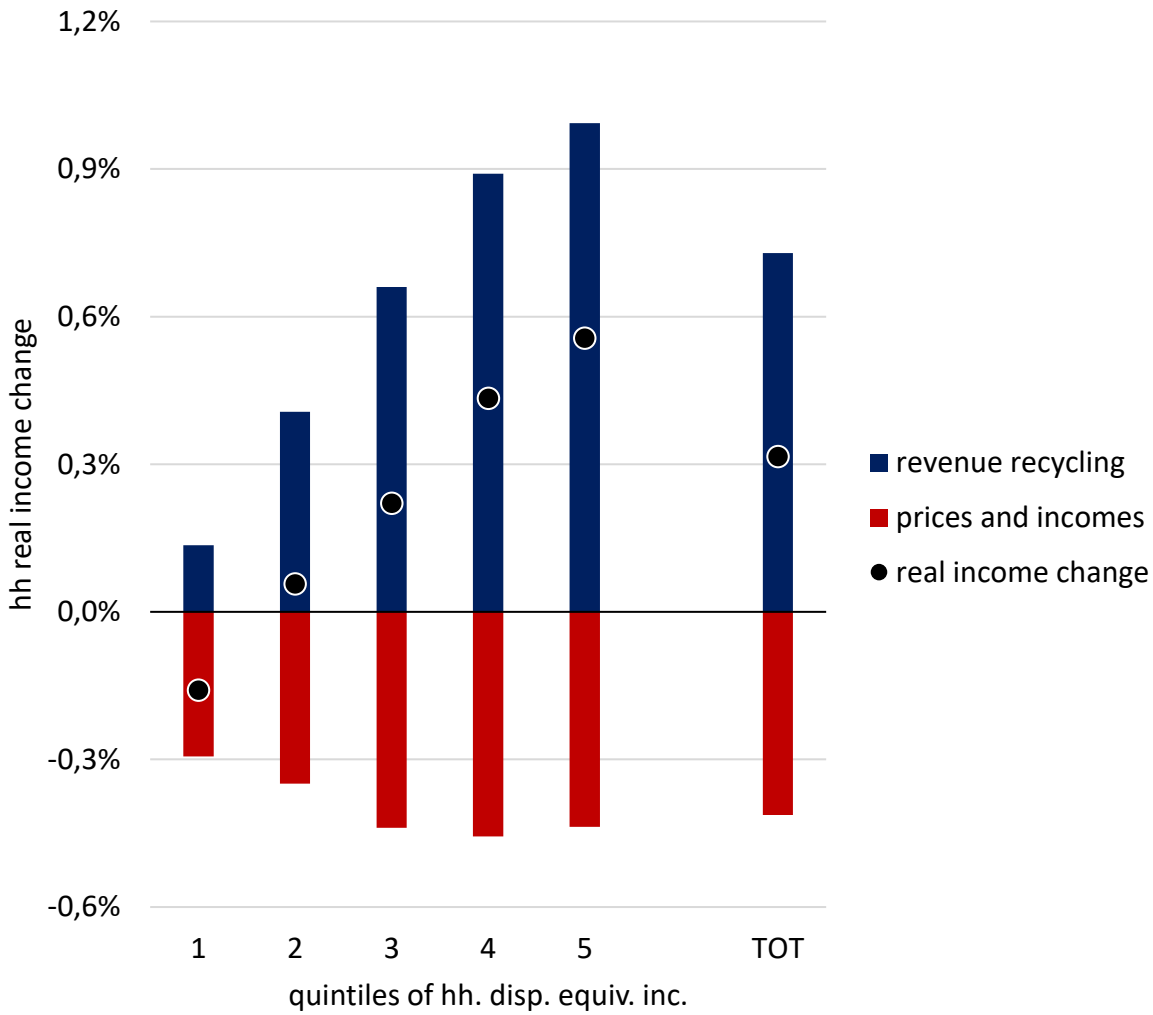
wage medium-sk.	-1,35%
wage high-sk.	-0,51%
hours low-sk.	+0,07%
hours medium-sk.	-0,05%
hours high-sk.	+0,11%
rate of return	-0,46%
tax rate (p.p. change)	-0,85p.p.

Preliminary results

Day-after impact of CTS in household sector



GE-impact of CTS



Preliminary results

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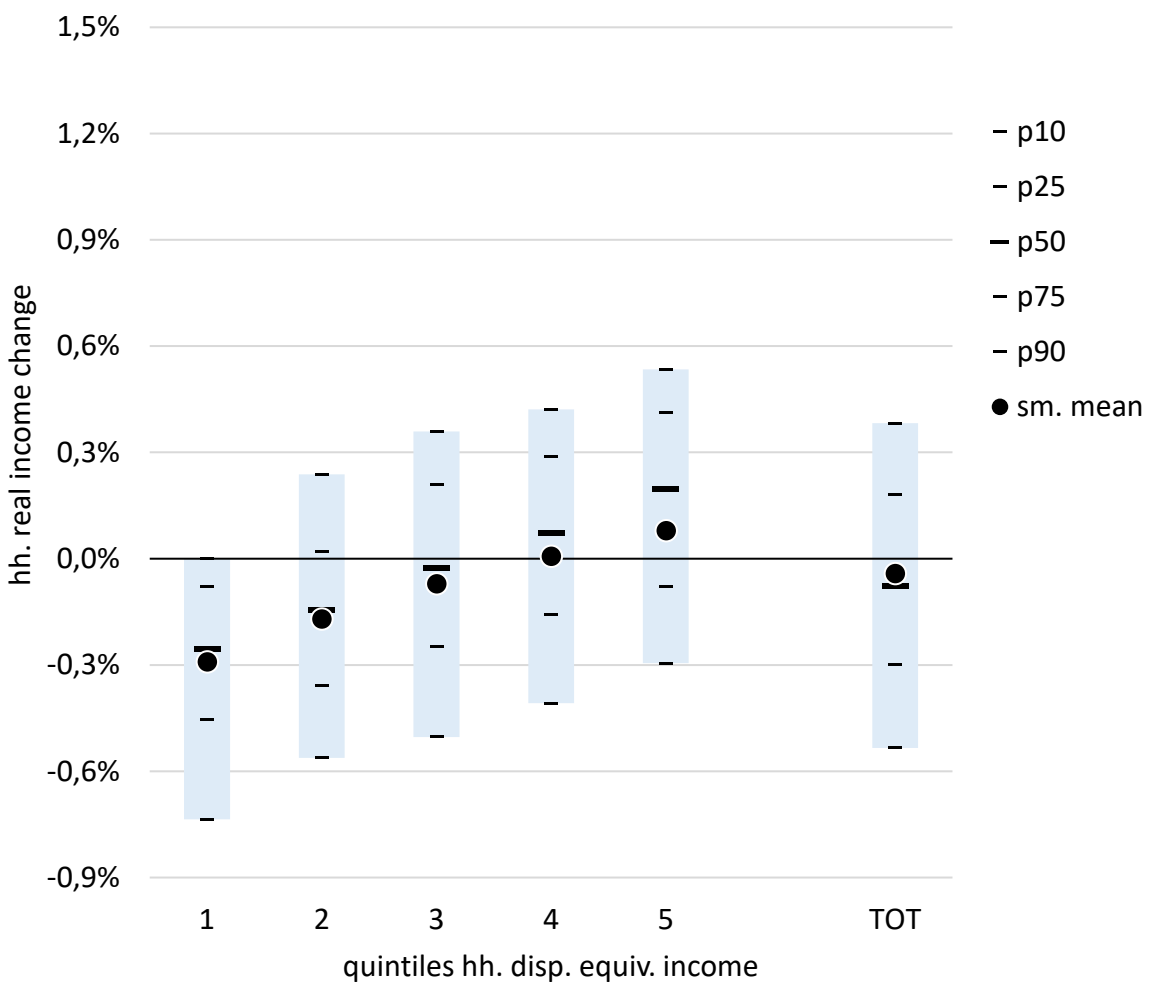
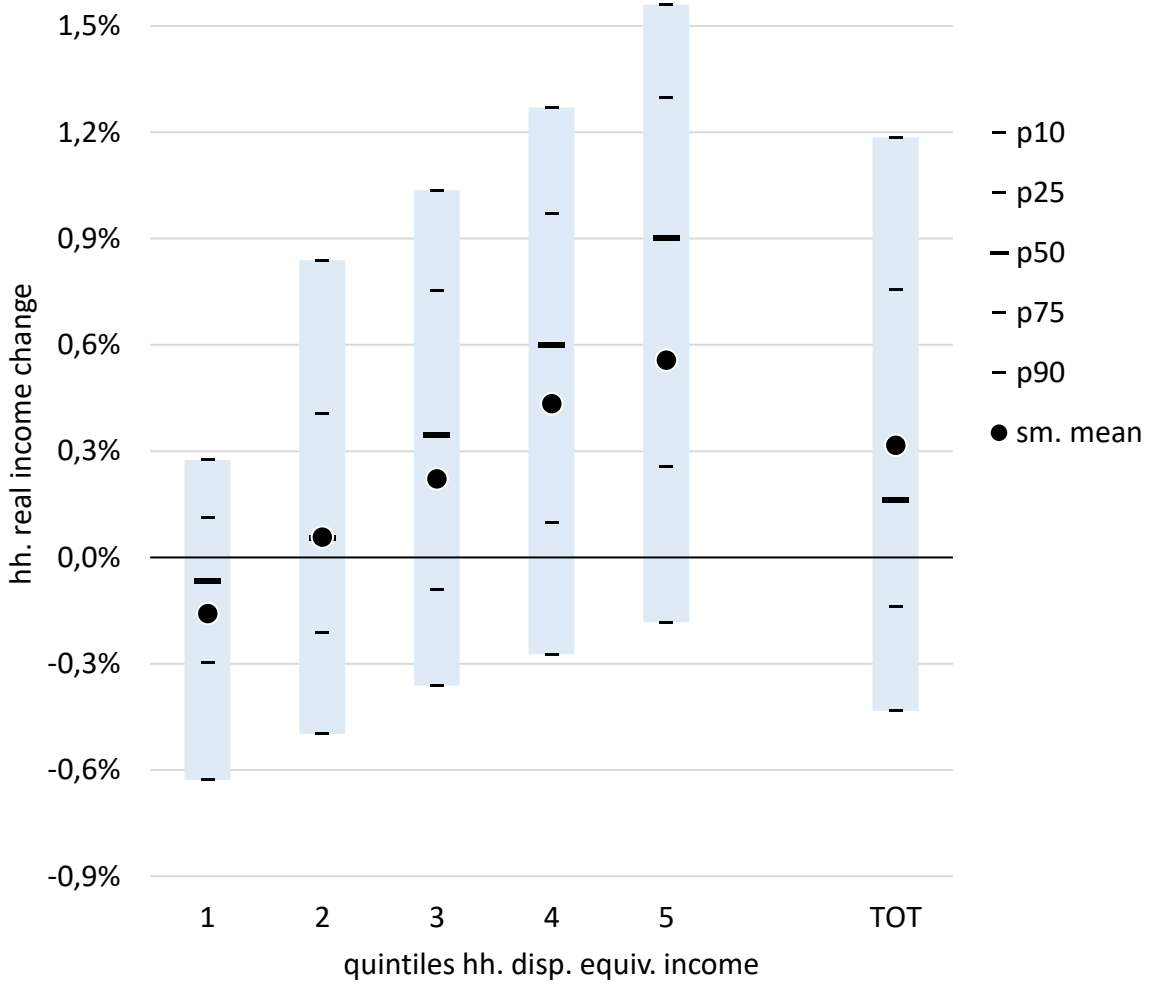
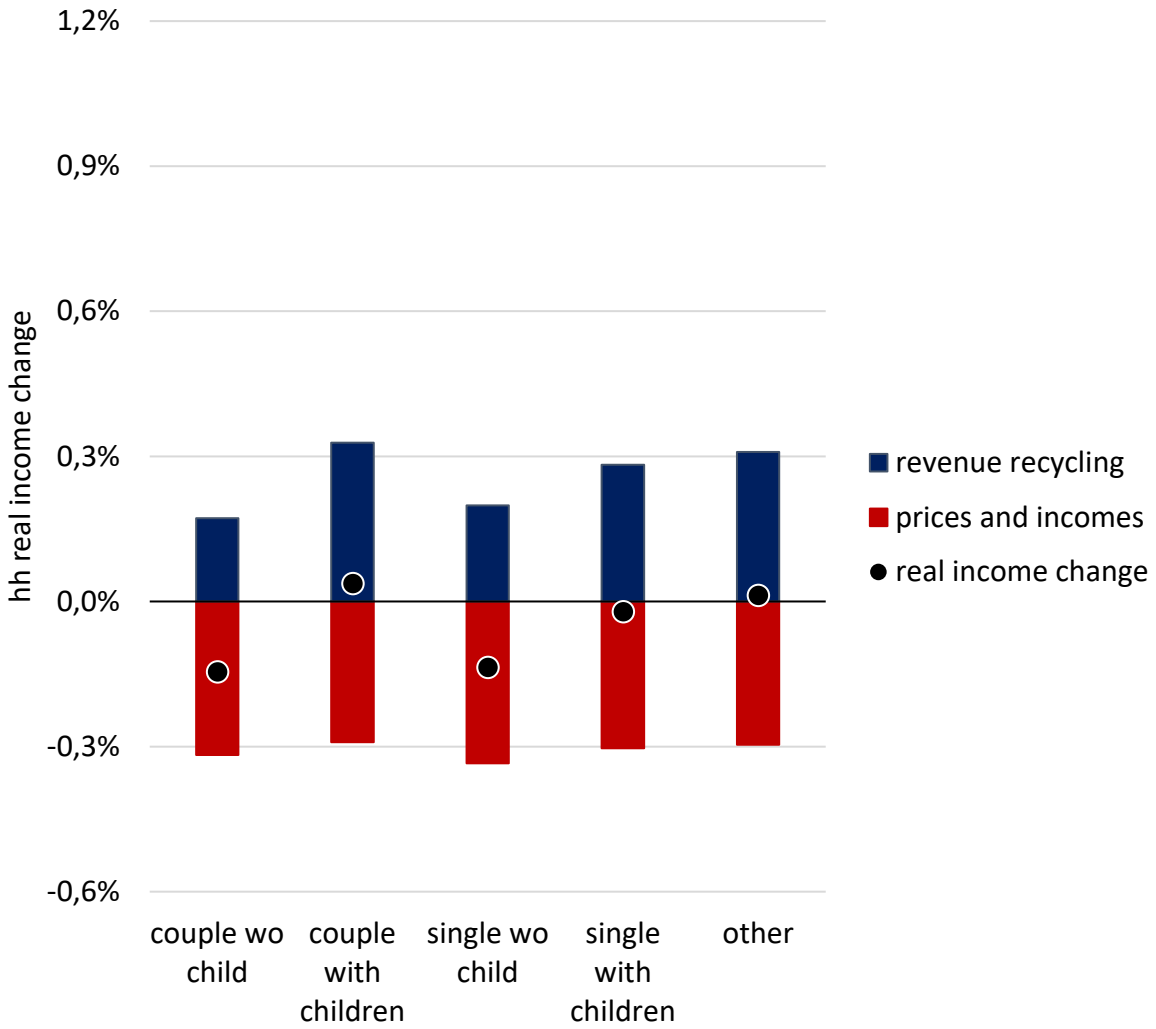


GE-impact of CTS

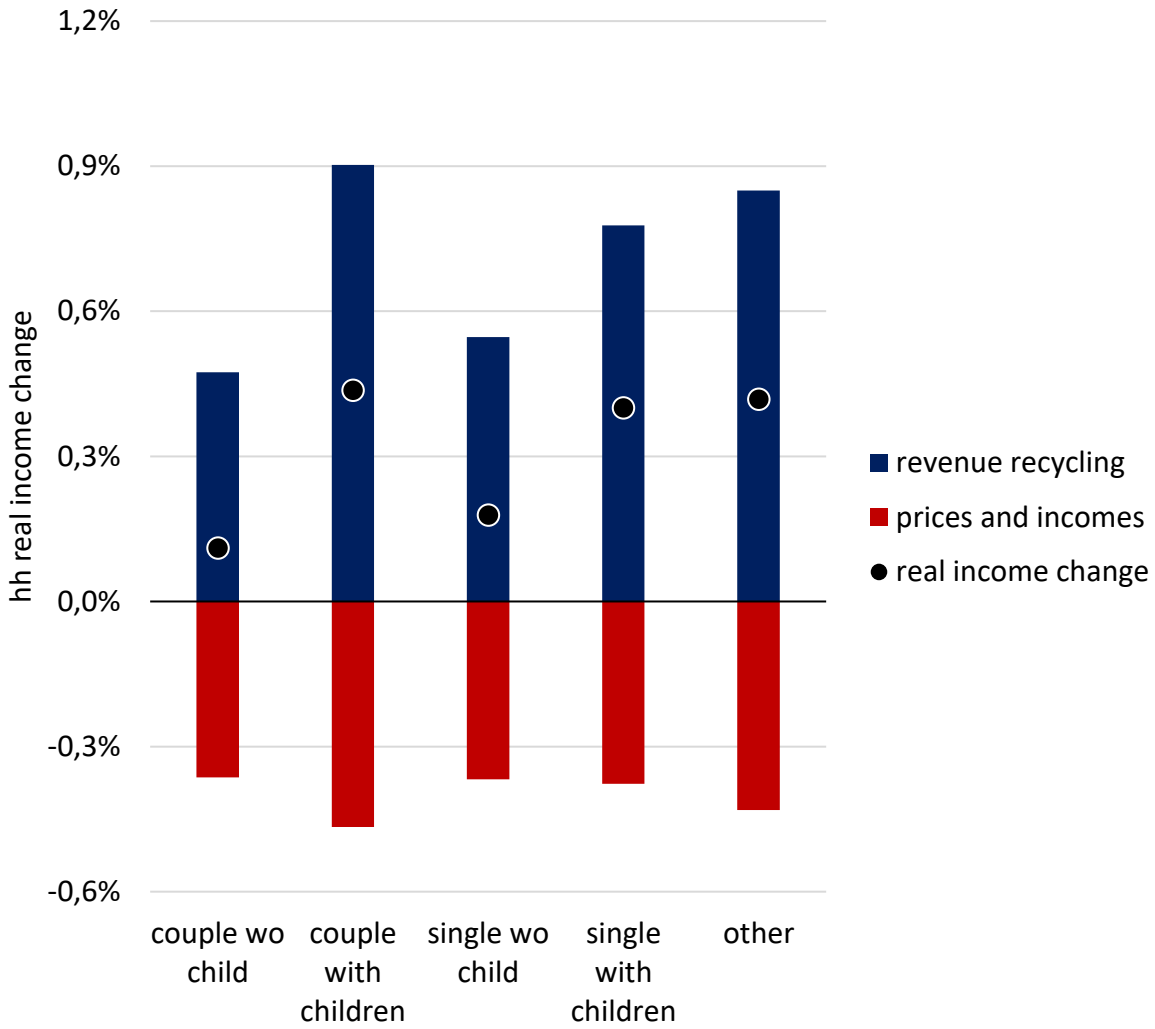


Preliminary results

Day-after impact of CTS in household sector



GE-impact of CTS



Preliminary results

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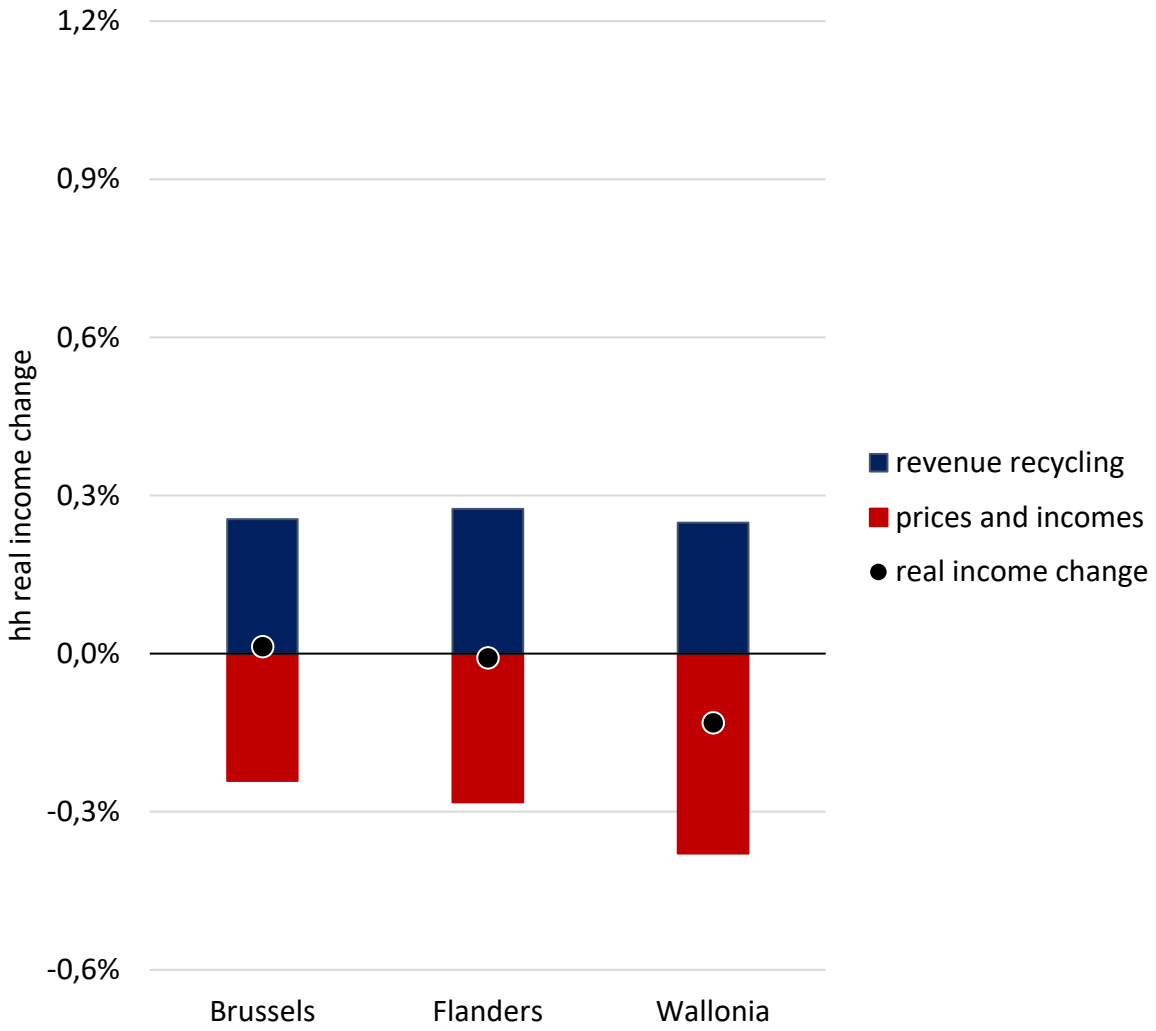
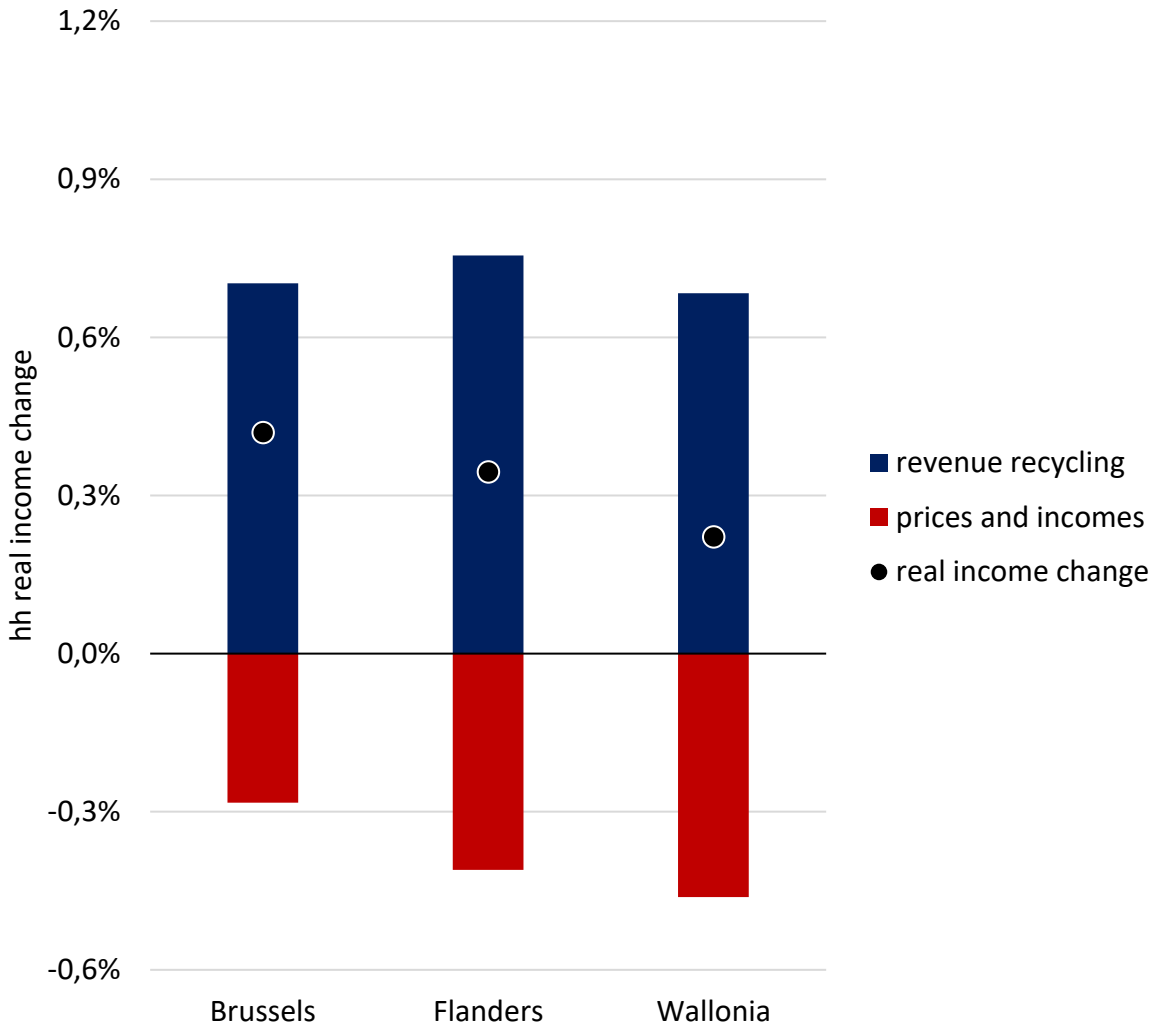
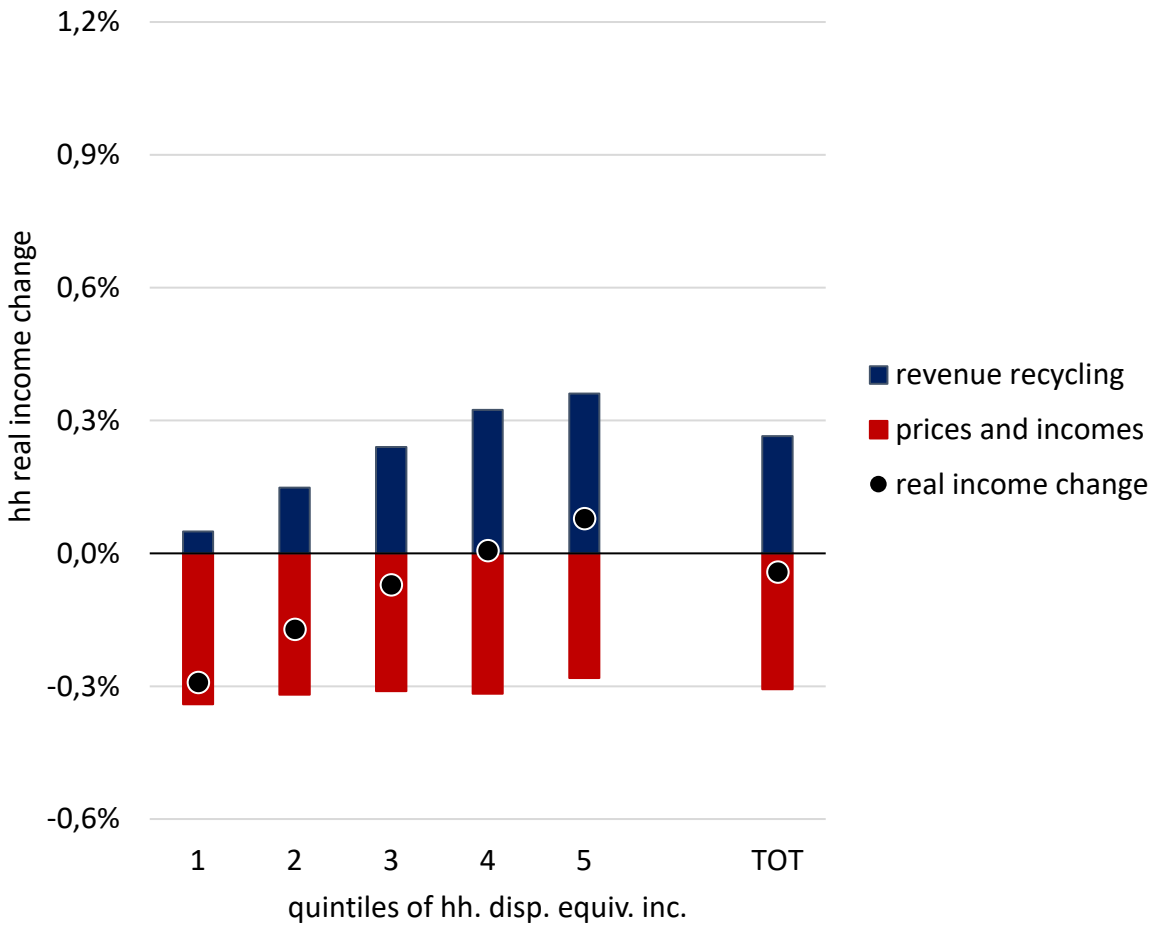


GE-impact of CTS

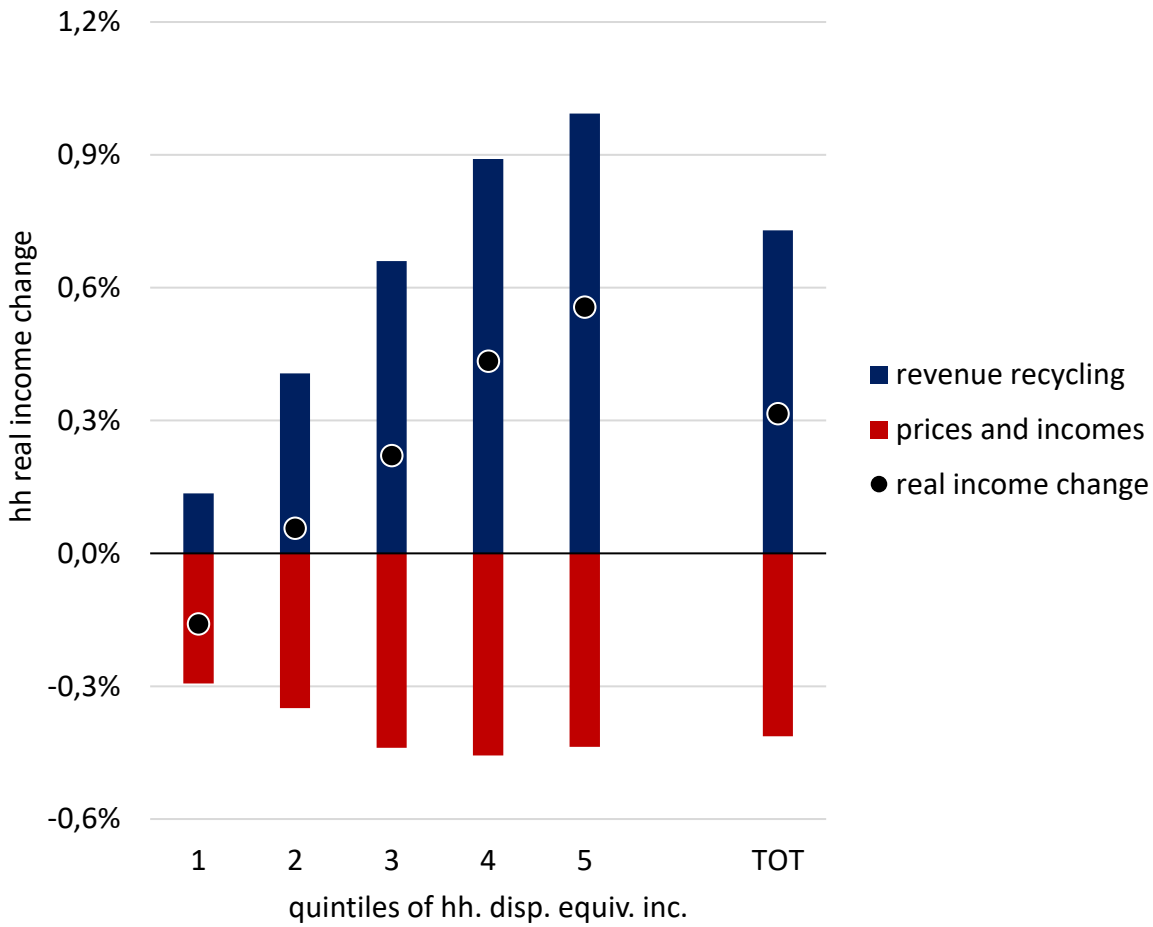


Preliminary results

Day-after impact of CTS in household sector: RR with decrease labor income tax rate

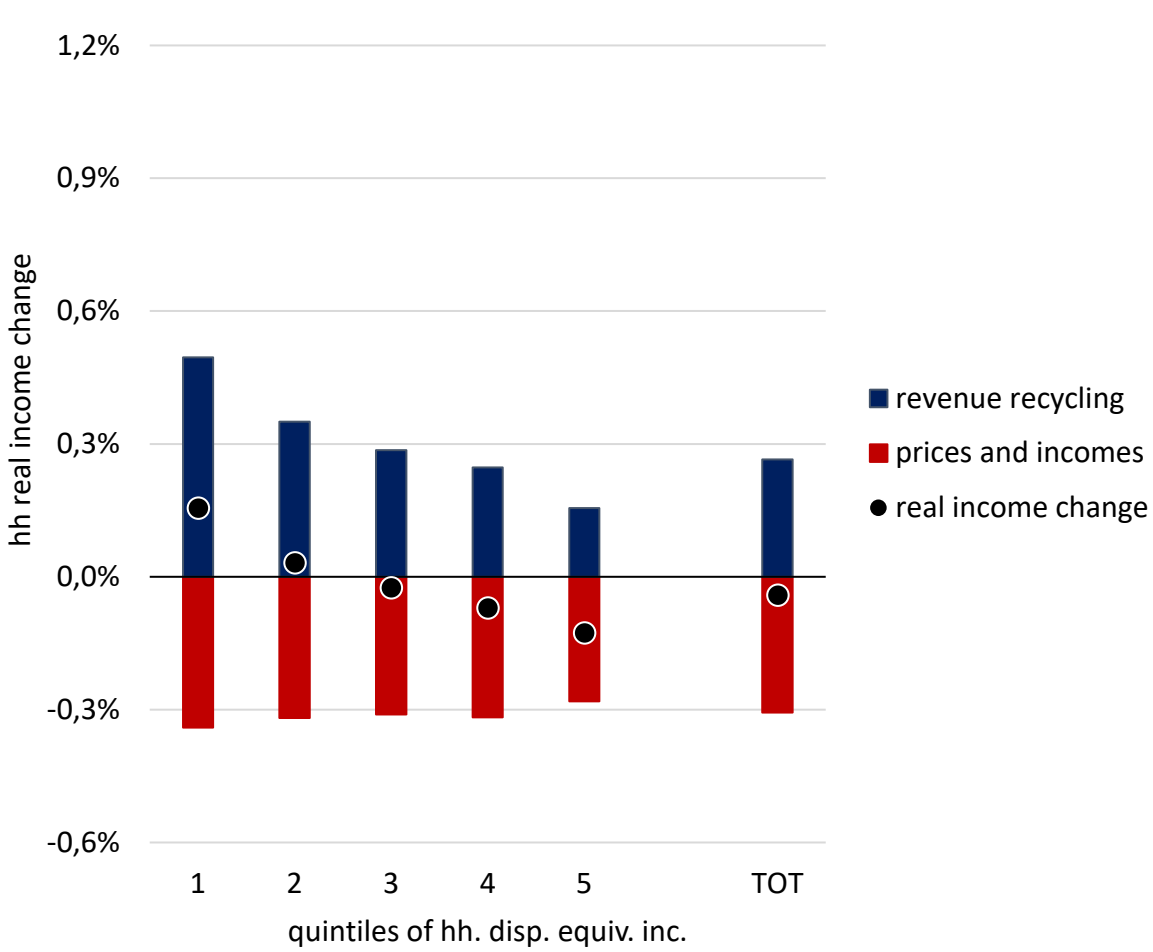


GE-impact of CTS: RR with decrease labor income tax rate

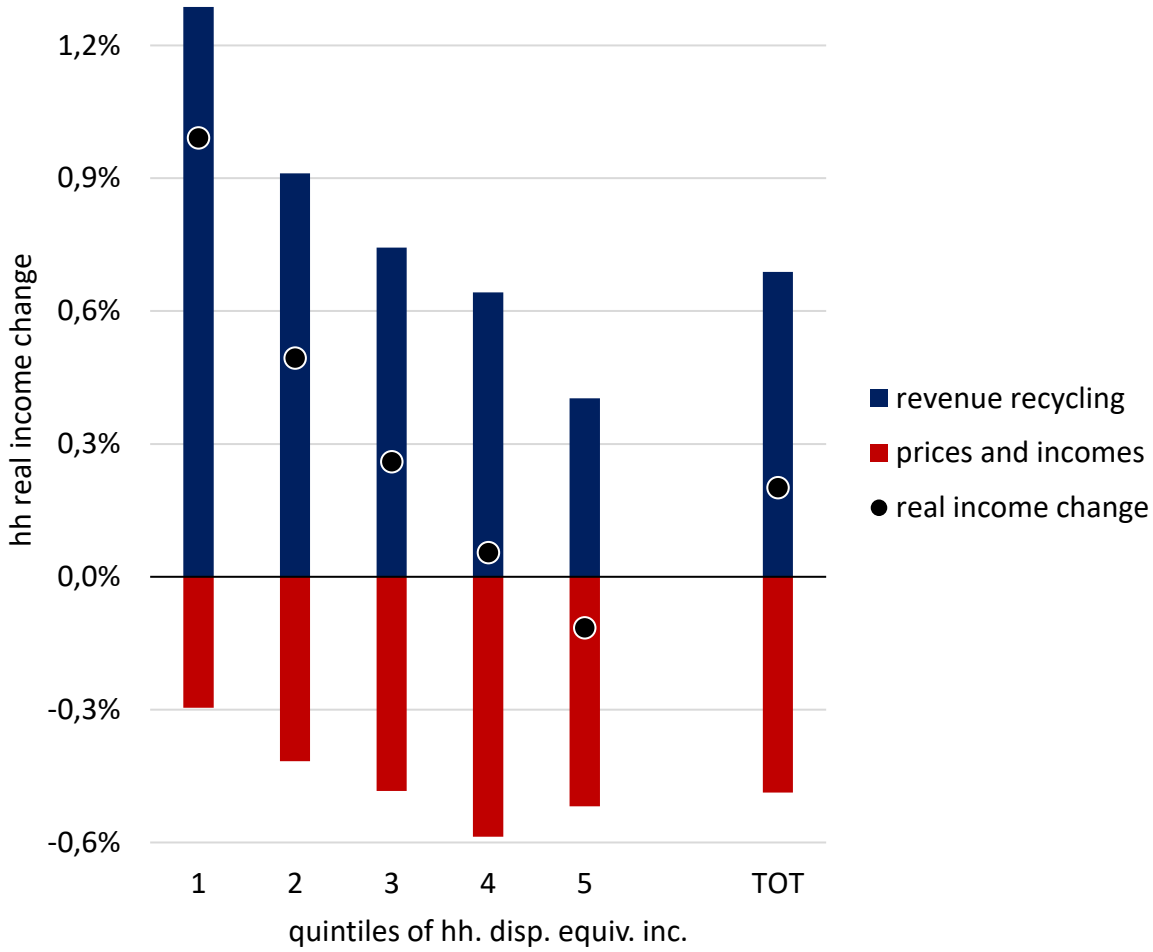


Preliminary results

Day-after impact of CTS in household sector: RR with carbon dividend (lumpsum)

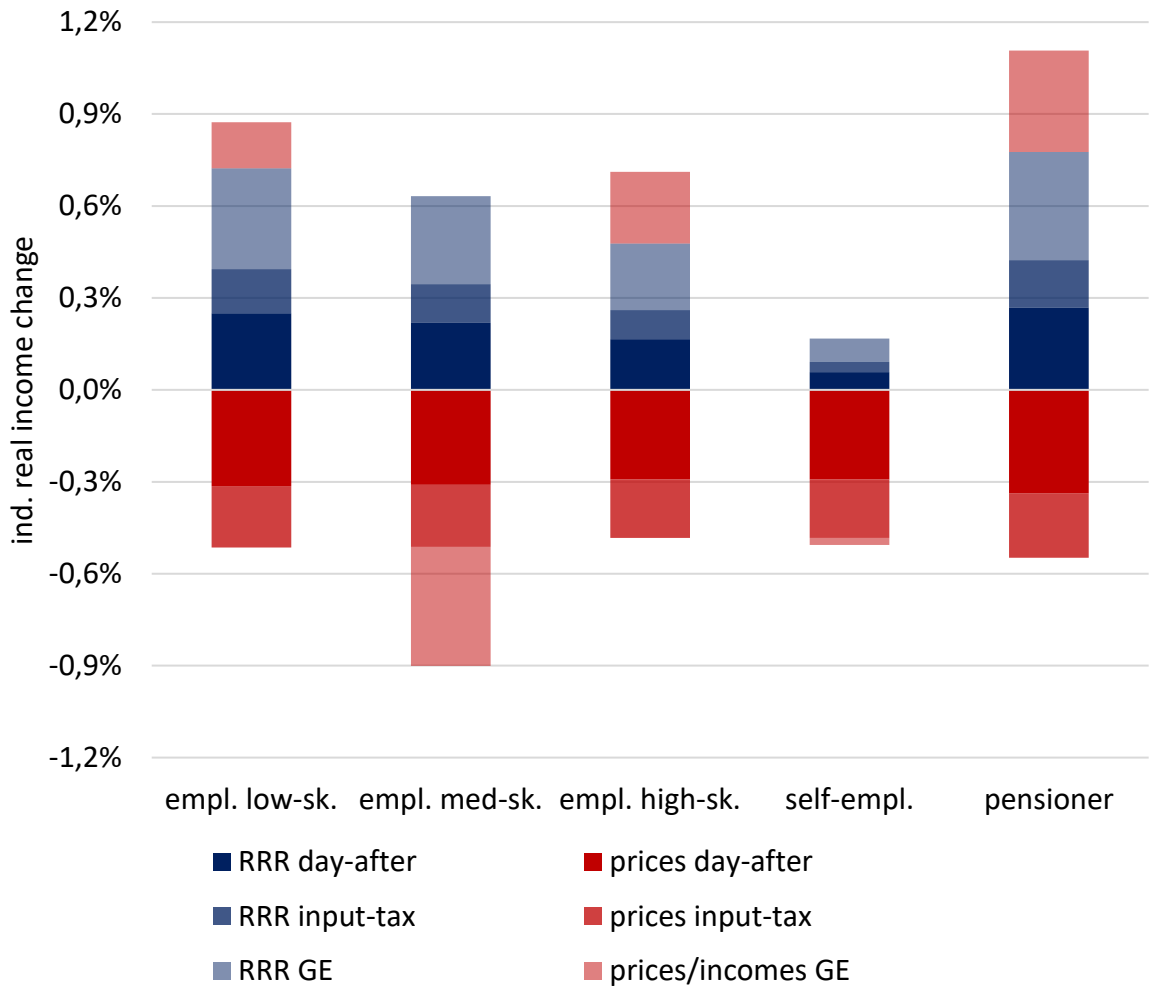


GE-impact of CTS: RR with carbon dividend (lumpsum)



Preliminary results

Decomposition of GE-impacts of CTS with carbon dividend

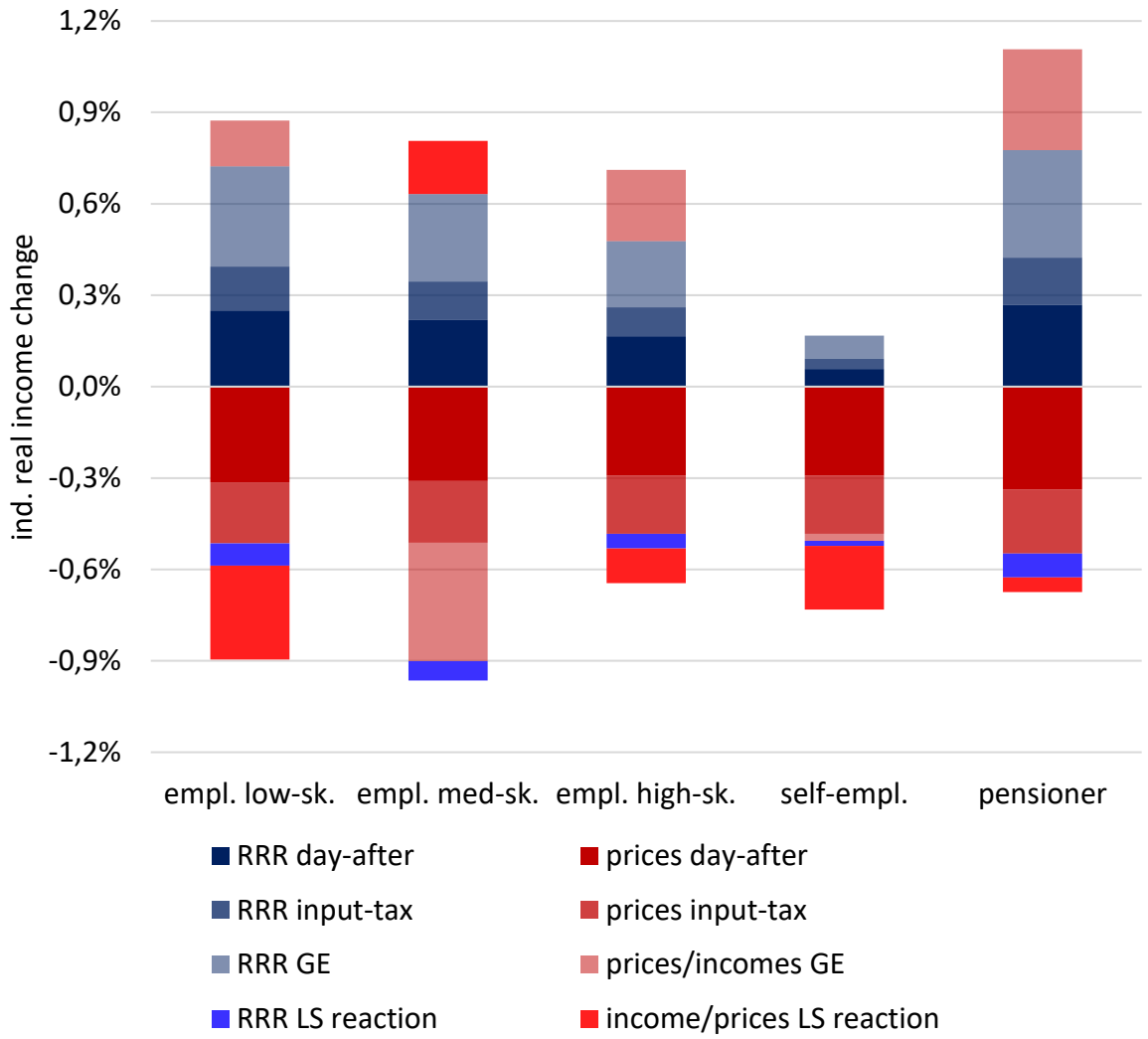


Change in:

CPI	0,00%
price of heating	+5,99%
price of private transport	+0,92%
price of electricity	+2,69%
price of services	-0,46%
price of other goods	-0,26%
wage low-sk.	-0,69%
wage medium-sk.	-1,63%
wage high-sk.	-0,31%
hours low-sk.	
hours medium-sk.	
hours high-sk.	
rate of return	-0,48%
lumpsum carbon dividend	€15 p.c.p.m.

Preliminary results

Decomposition of GE-impacts of CTS with carbon dividend

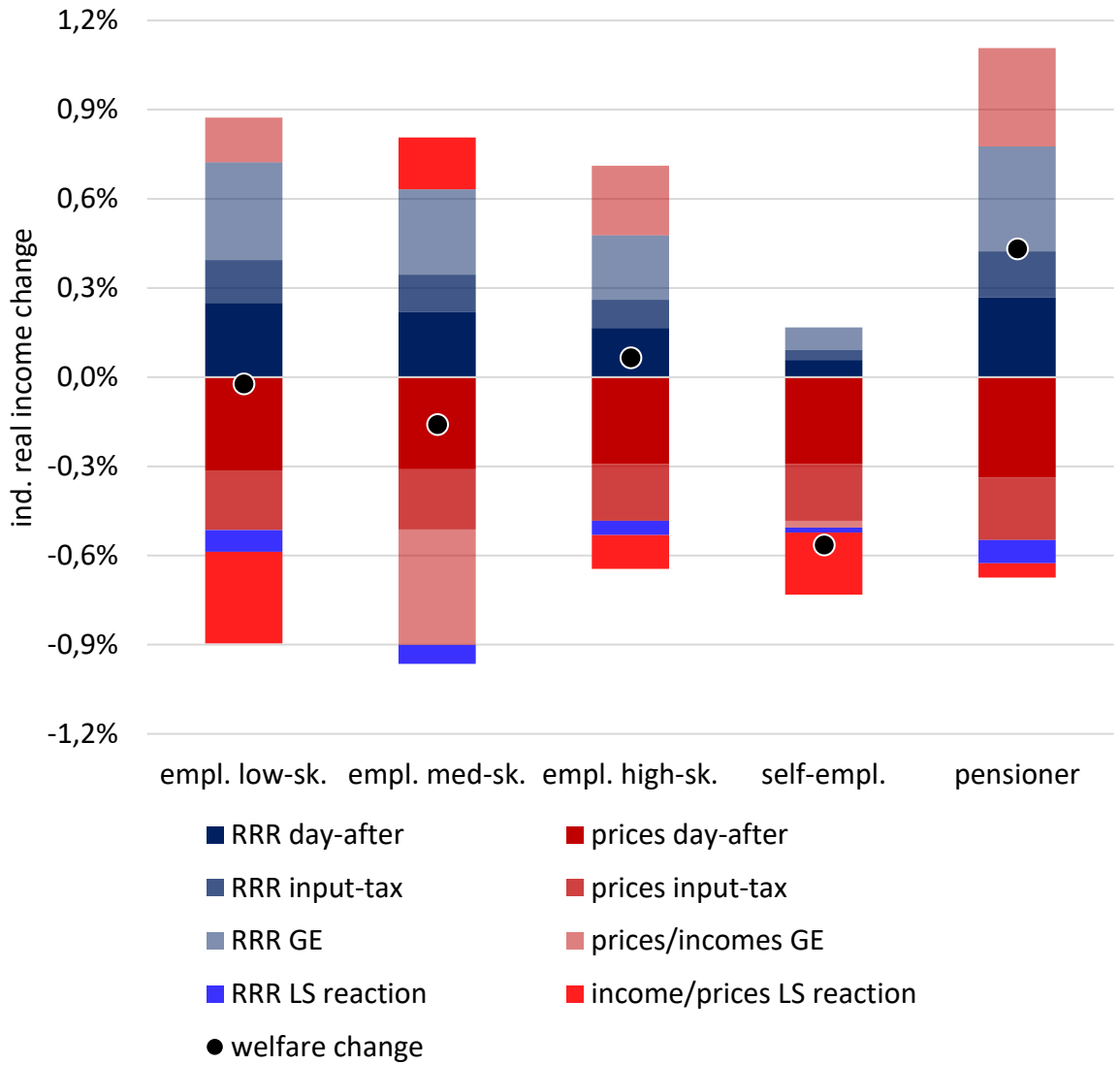


Change in:

CPI	0,00%
price of heating	+6,01%
price of private transport	+0,95%
price of electricity	+2,68%
price of services	-0,47%
price of other goods	-0,22%
wage low-sk.	-0,48%
wage medium-sk.	-1,07%
wage high-sk.	-0,38%
hours low-sk.	-0,28%
hours medium-sk.	-0,24%
hours high-sk.	-0,06%
rate of return	-0,68%
lumpsum carbon dividend	€13 p.c.p.m.

Preliminary results

Decomposition of GE-impacts of CTS with carbon dividend



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rate of return	-0,68%
lumpsum carbon dividend	€13 p.c.p.m.

Yes, general-equilibrium effects matter:

- Distributional impact of GE in line with first-order impact of CTS
  - Driven by revenue recycling design

- Additional distributional element due to job polarization/factor prices
  - Important within active population, not so much in entire population
  - Depends on labor supply reaction
    - Low labor supply reaction in case of proportional tax rate decrease
    - Negative labor supply reaction in case of lumpsup carbon dividend
  - Rate of return on capital important for self-employed

- Efficiency vs. equity
  - Carbon dividend progressive, labor tax rate reduction regressive
  - But large loss in employment and smaller average real income change

Improvements in top-down setting

- Capital income imputation from HFCS
  - Valorize experience in BE-PARADIS project
  - but will still be underrepresentation
- Mixed income vs. capital income -> different behavior in CGE?
- Quid progressive tax rates in MSM vs. linear taxes in CGE?

➢ Guide socio-demographic covariates in survey

- expenditure pattern proxy's

➢ Towards integrated micro-macro approach

- Use "real RURO" for labor supply reactions and implied commodity demand
  - Additional heterogeneity within labor types on labor market
  - Rich heterogeneity in commodity demand

1. Our primary research objectives
2. The micro-modelling infrastructure in E4BEL
3. Top-down approach: Do GE-effects matter?
4. **Planning**

WP's and tasks:	2023				2024				2025				2026			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
WP1: State of the art			✓													
WP2: MSM Model, data and estimation																
Task 2.1 - 2.5 MSM on survey data							✓									
Task 2.6 -2.10 MSM on admin data																
WP4: integration CGE and MSM																
Task 4.1 Initial versions									(✓)							
Task 4.2 Final versions																
WP6: Policy design/simulations																
Task 6.1 First set of scenarios										(✓)						
Task 6.2 second set of scenarios																

REFERENCES

Capéau, B., Decoster, A., and Van Houtven, S. (2024), Piecemeal Modelling of the Effects of Joint Direct and Indirect Tax Reforms. *Public Finance Review,* 52(1), 111-149.

Van Dyck, T., Weitzel, M., Wojtowicz, K., Los Santos, L.R., Maftei, A., Riscado, S. (2021), Climate policy design, competitiveness and income distribution: A macro-micro assessment for 11 EU countries. *Energy Economics,* 103.

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RESEARCH INSTITUTE FOR WORK AND SOCIETY

E4BEL Steering Committee

Public Acceptability of Carbon Pricing

Jeroen Barrez & Kris Bachus

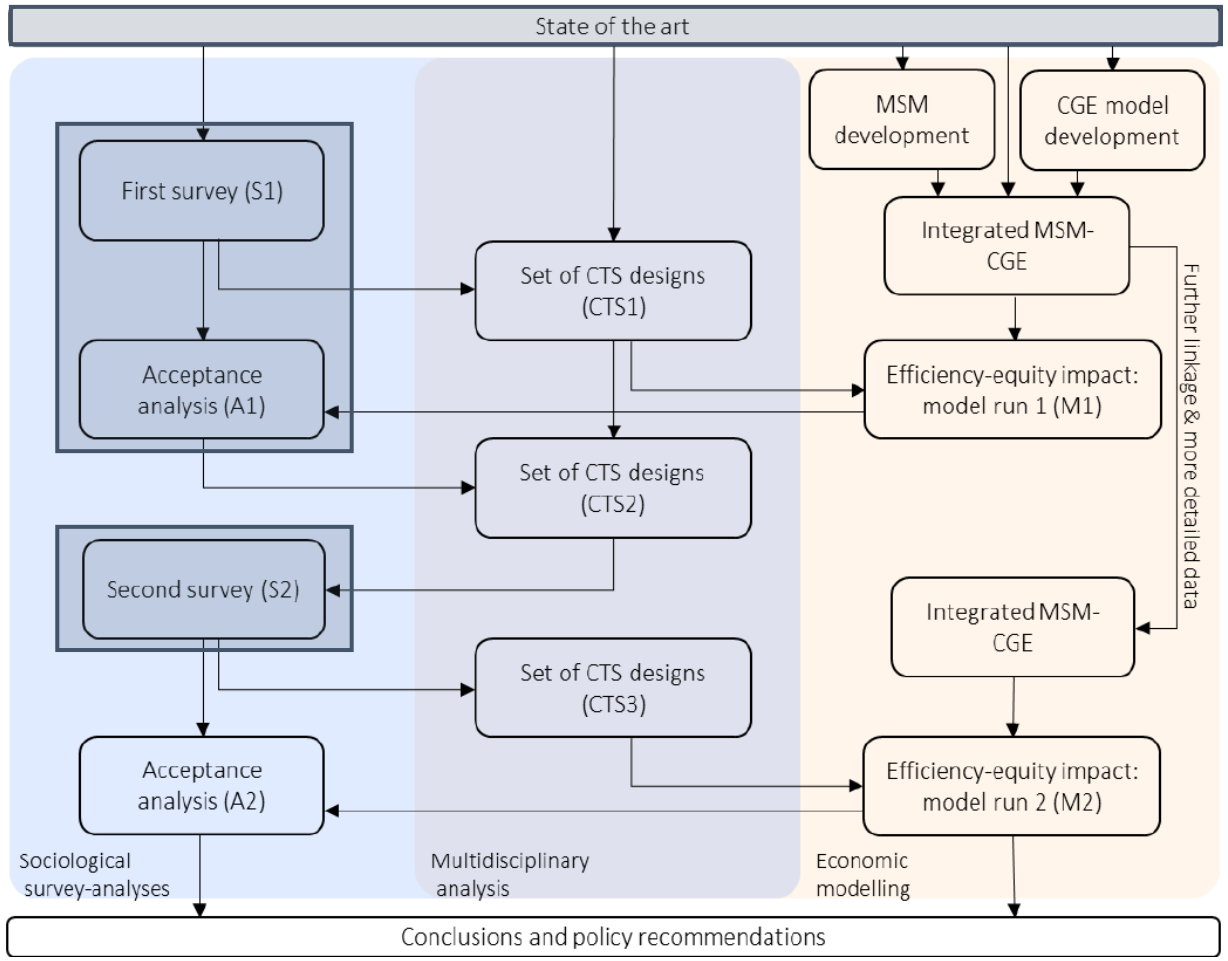
February 4, 2025

E4BEL

Equity, efficiency and acceptability of carbon pricing in Belgium

EQUITY, EFFICIENCY & ACCEPTABILITY OF CARBON PRICING IN BELGIUM

1. Literature review
   - E4BEL Working paper - HIVA report
   - Barrez, J. (2024). Public acceptability of carbon pricing: Unravelling the impact of revenue recycling. Climate Policy, 24(10), 1–23.
2. Results survey 1:
   - 2.1 "Public acceptability of a carbon pricing package: the role of revenue recycling"
   - 2.2 "Seeking common ground? Support for carbon pricing and climate policies across subgroups"
3. Survey 2: discrete choice experiment

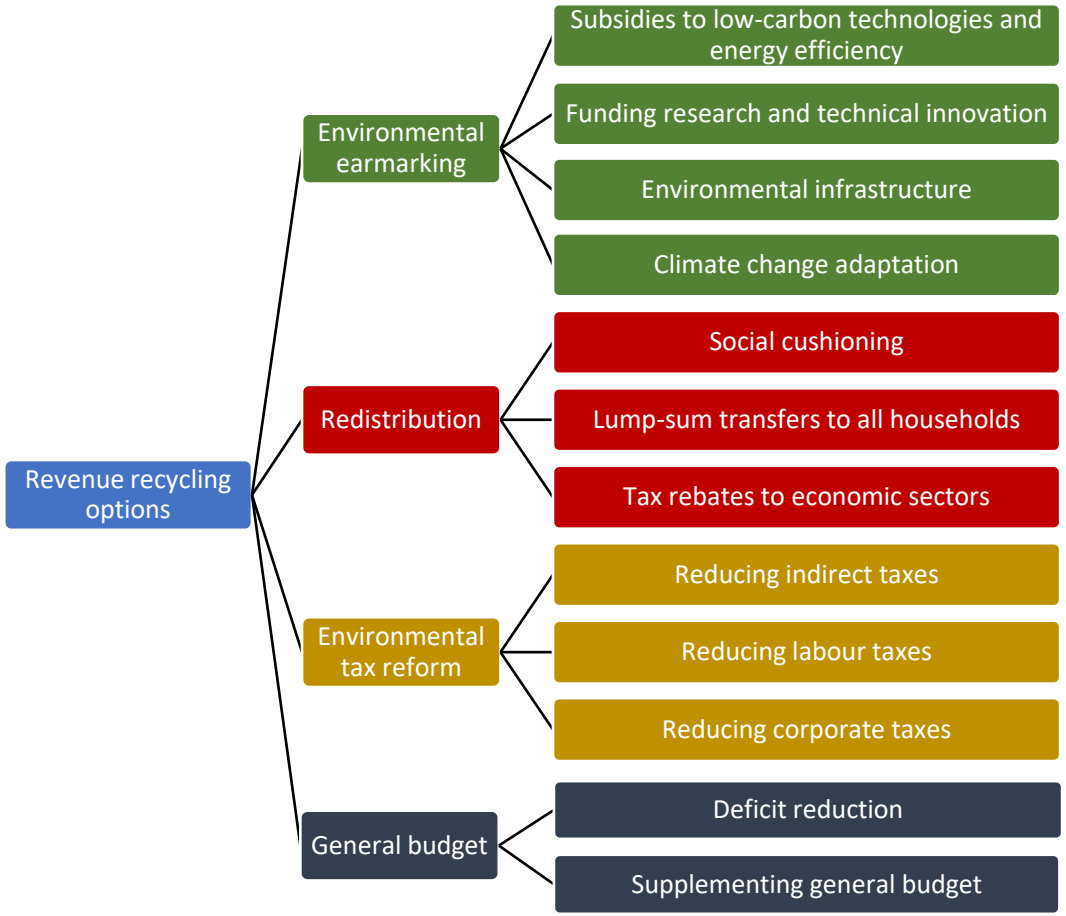


1. Public acceptability of carbon pricing: unravelling the impact of revenue recycling

Systematic literature review:

- Qualitative content analysis - 48 relevant studies from 2004 to March 2023
- Empirical evidence on the relation between public acceptability of carbon pricing and revenue recycling

- Public acceptability depends substantially on revenue recycling.
- Typology of revenue recycling options



Barrez, J. (2024). Public acceptability of carbon pricing: Unravelling the impact of revenue recycling. *Climate Policy*, *24*(10), 1–23. https://doi.org/10.1080/14693062.2024.2376747

Consensus ordinal ranking of revenue recycling options

Ranking	Revenue recycling option	Points
1	Subsidies to low-carbon technologies and energy efficiency	8
1	Environmental infrastructure	8
3	Reducing indirect taxes	3
4	Climate change adaptation	2
4	Tax rebates to economic sectors	2
4	Social cushioning	2
7	Reducing labour taxes	1
8	Deficit reduction	-4
9	Lump-sum transfers	-6
10	Supplementing general budget	-7
11	Reducing corporate taxes	-9

Environmental earmarking

Redistribution

Environmental tax reform

General budget

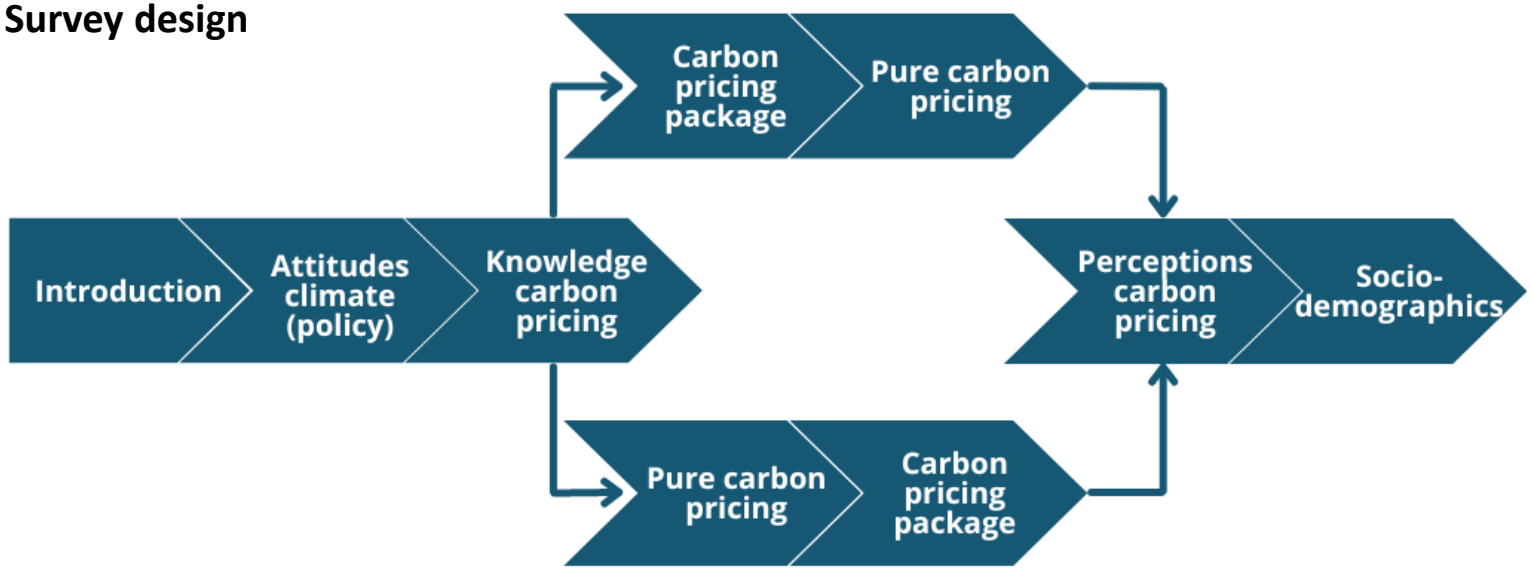
Environmental earmarking is the most preferred way of revenue recycling.

Barrez, J. (2024). Public acceptability of carbon pricing: Unravelling the impact of revenue recycling. *Climate Policy*, *24*(10), 1–23. https://doi.org/10.1080/14693062.2024.2376747

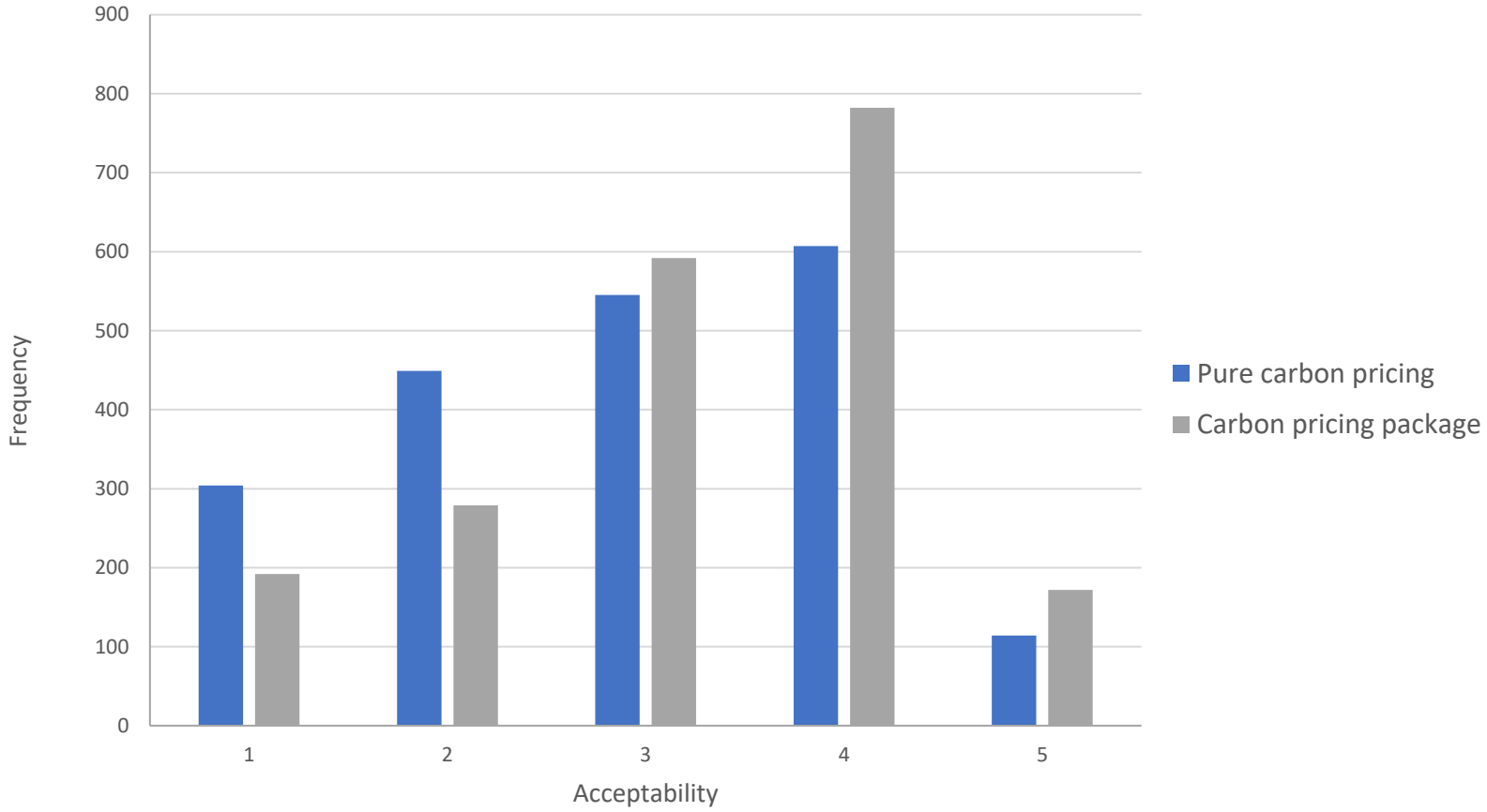
2. Survey 1

- Web-based survey targeting the general Belgian population aged 18 and older in February 2024.
- Interlocked quotas for sex, age, and region, non-interlocked quotas for education (high vs. other levels).
- N = 2123

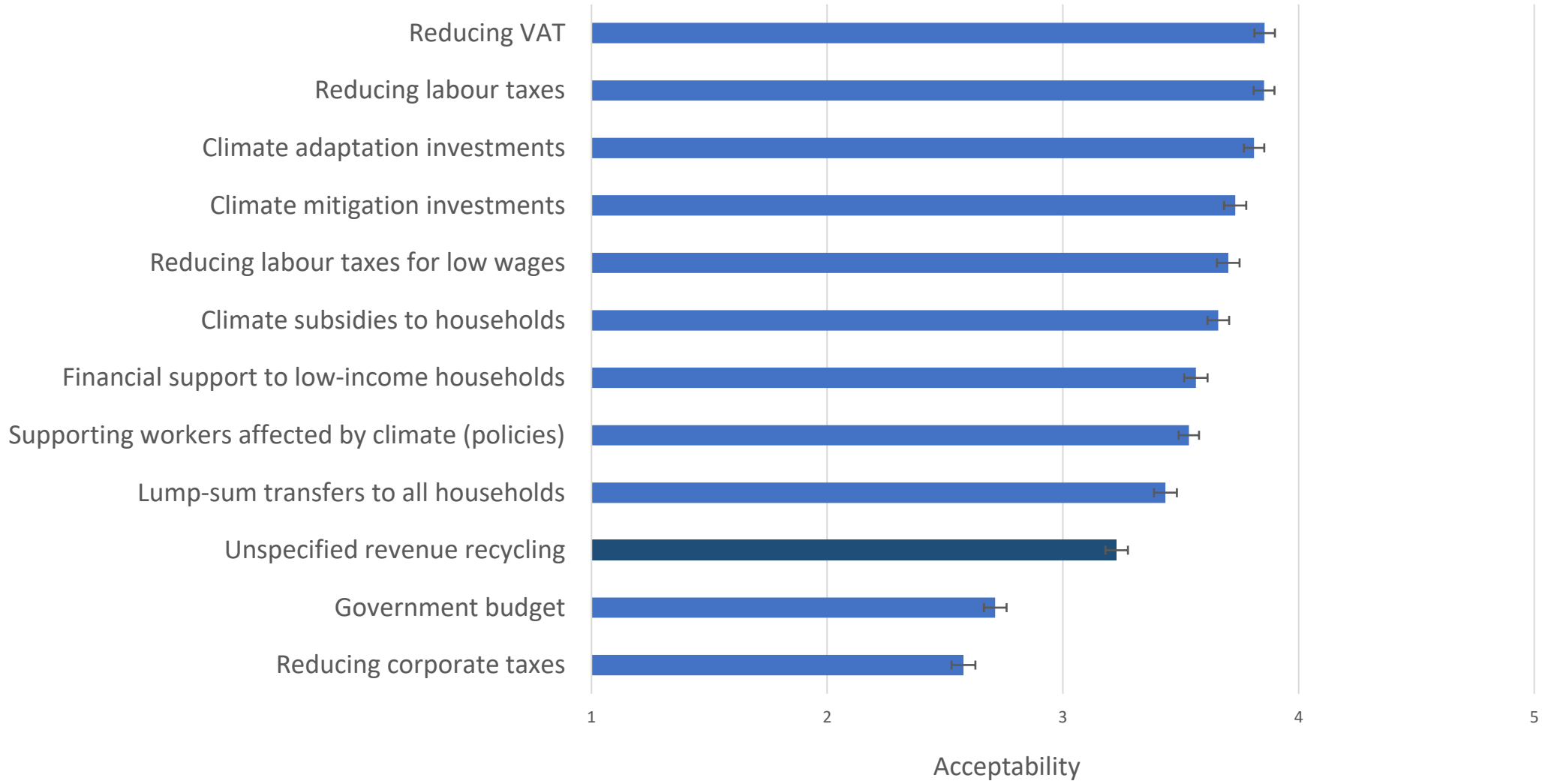
Survey design



2.1 Public acceptability of a carbon pricing package: the role of revenue recycling



Acceptability of carbon pricing policies



2.2 Seeking common ground? Support for carbon pricing and climate policies across subgroups

- Public support for climate policies and carbon pricing is a more complicated and layered concept than simple majority approval (e.g. Sommer et al., 2022; Tatham & Peters, 2023).
- Exploring whether (lack of) support for climate policies, and especially carbon pricing policies, is concentrated in specific groups by employing an audience segmentation.

"Studying the distribution of beliefs across groups, and the intensity of preferences, is at least as important as understanding the preferences of the majority."

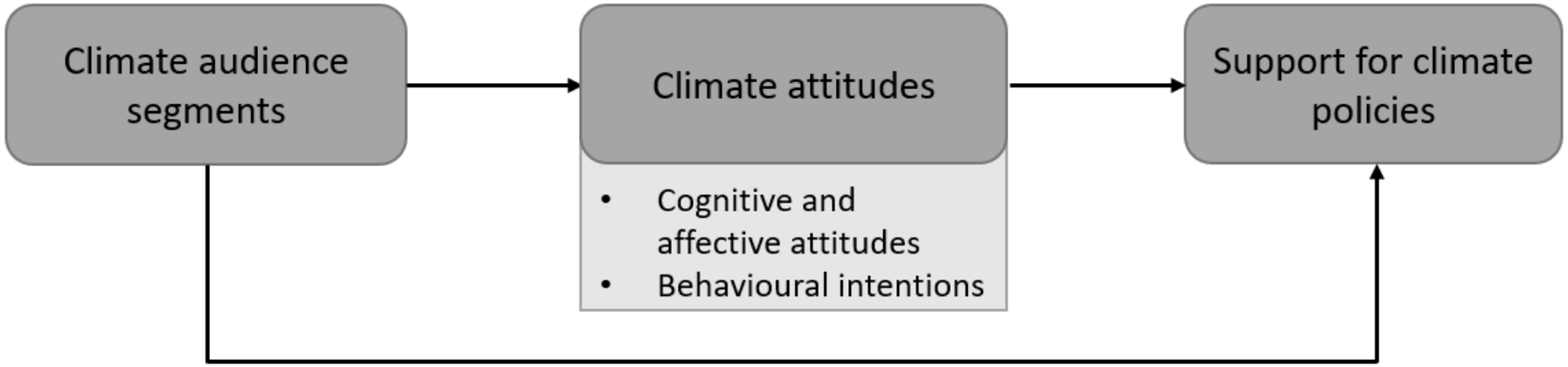
Kallbekken, S. (2023). Research on public support for climate policy instruments must broaden its scope. *Nature Climate Change*, *13*(3), 206–208.

Audience segmentation - latent class analysis

- Identify homogeneous and distinct subgroups
- Local independence:
  - observed variables are independent given latent class membership
- Classes are:
  - mutually exclusive (each individual belongs to one class)
  - exhaustive (all individuals belong to one class)

Source: https://www.umass.edu/family/events/latent-class-analysis-part-1

Framework of analysing support for climate policies through audience segments

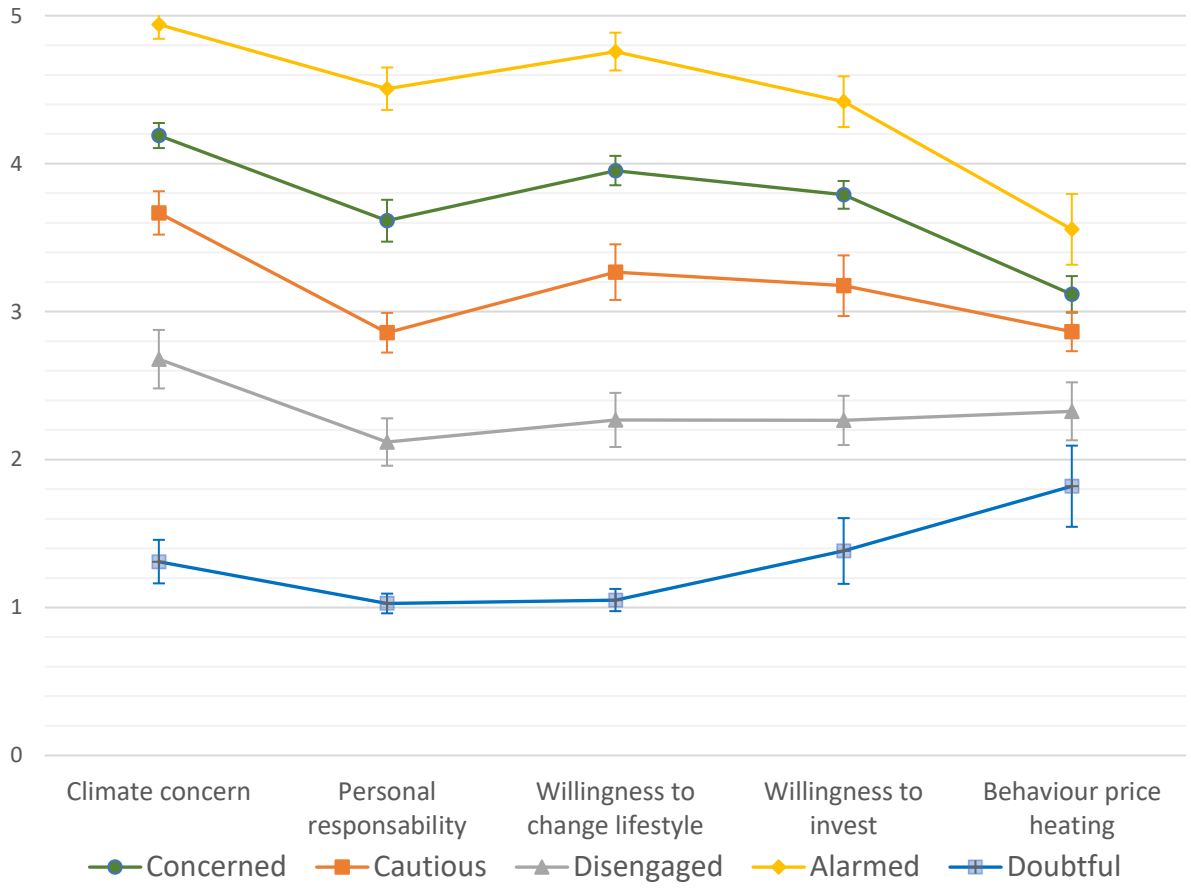


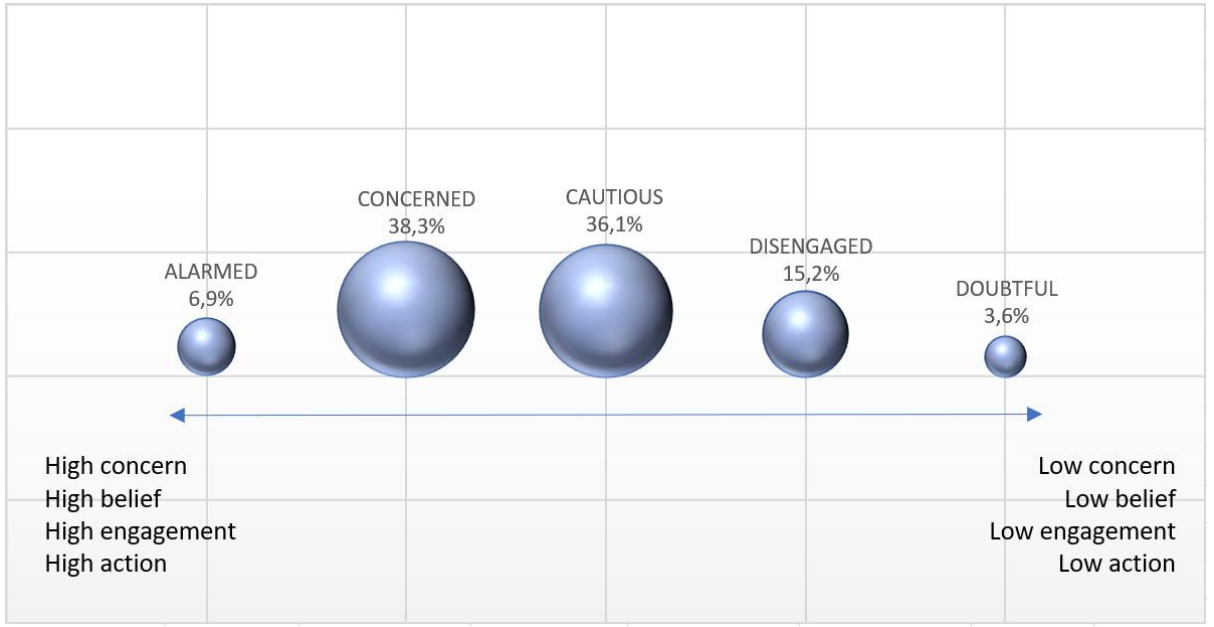
'Inactive-covariate' approach (Magidson & Vermunt, 2001; Vermunt, 2010)
Stepwise latent class analysis (Vermunt & Magidson, 2021).

Variables - latent class analysis

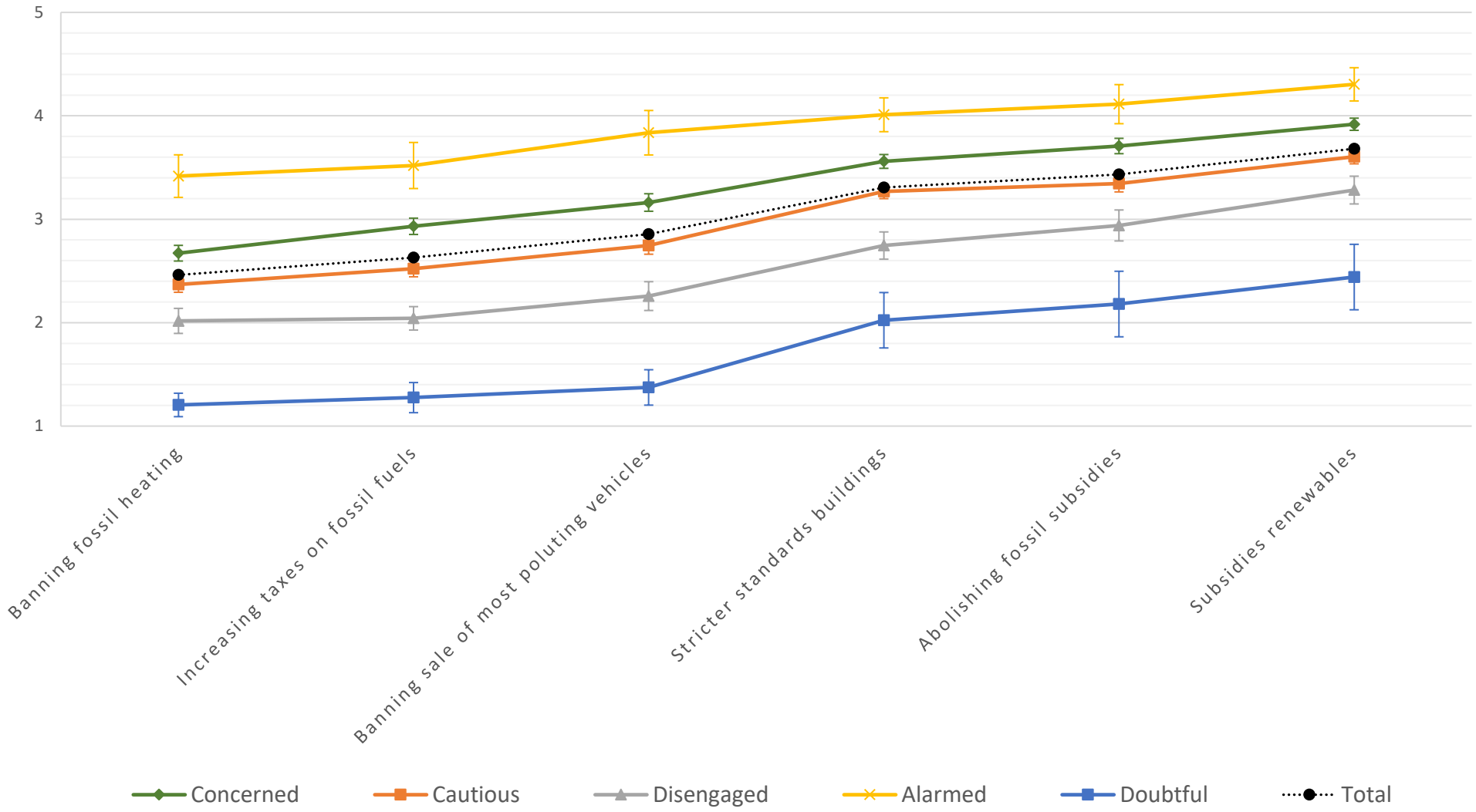
	VARIABLES	DESCRIPTION
CLIMATE ATTITUDES	Climate concern	To what extent are you concerned about climate change? (1) Not concerned at all; (2) Not concerned; (3) Neutral; (4) Concerned; (5) Very concerned.
	Climate cause	What do you think is causing the current climate change? (1) Entirely natural processes; (2) Mainly natural processes; (3) About equally by natural processes and human activity; (4) Mainly human activity; (5) Entirely human activity; (6) I don't think the climate is changing; (99) I don't know
	Personal responsibility	To what extent do you feel personally responsible for mitigating climate change? (1) Not at all; (2) Not particularly; (3) Neutral; (4) Quite a bit; (5) Very much.
BEHAVIOURAL INTENTIONS	Willingness to change lifestyle	To what extent are you willing to change your lifestyle (e.g., eat less meat, use more public transportation, etc.) to mitigate climate change? (1) Not willing; (2) Not particularly willing; (3) Undecided; (4) Somewhat willing; (5) Very willing
	Willingness to invest	To what extent are you and your household willing to invest (further) financially in the climate transition (e.g. insulating your home, installing solar panels, installing heat pumps, driving electric, ...) over the next 5 years with financial support from the government? (1) Not willing; (2) Not particularly willing; (3) Undecided; (4) Somewhat willing; (5) Very willing
	Behaviour price heating	If prices to heat your home increased by 15% for fossil fuels (e.g. gas, heating oil, etc.), would you turn down your thermostat in the short term? For a typical household, this corresponds to an increase of €163 annually (or €13.6 monthly) for natural gas and €296 annually (or €24.7 monthly) for heating oil. (1) Set much lower; (2) Lower it; (3) Do not lower

Latent class analysis - audience segments





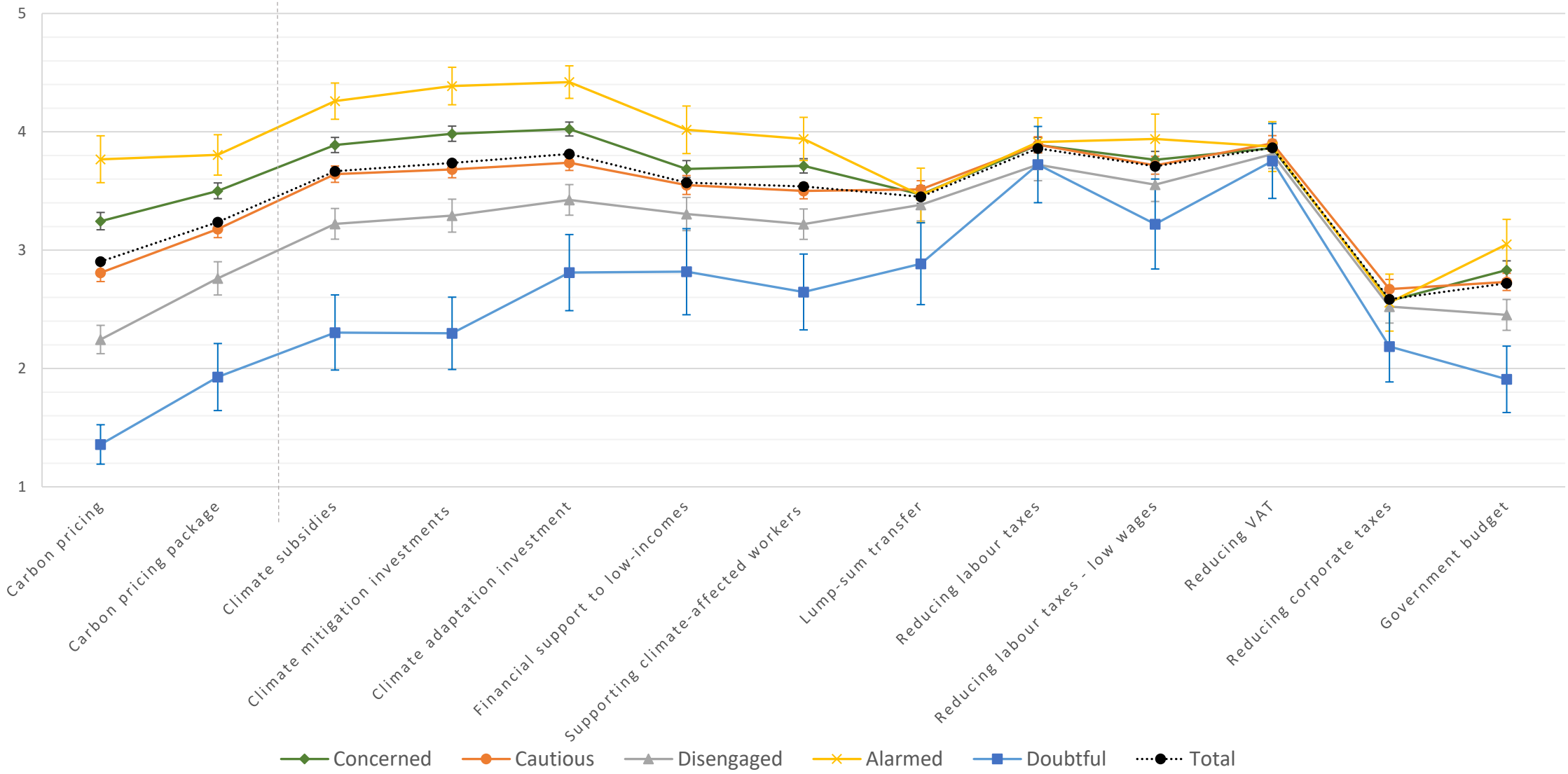
Support for climate policies by audience segments



Support for climate policies by audience segments

Model	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Environmental taxation	Subsidies renewables	Banning fossil heating	Banning sale tailpipe cars	Stricter norms buildings	Abolishing fossil subsidies
Alarmed	2.311***	2.349***	2.479***	2.270***	1.953***	1.820***
	(0.269)	(0.251)	(0.261)	(0.253)	(0.254)	(0.251)
Concerned	0.900***	0.879***	0.669***	0.724***	0.624***	0.902***
	(0.156)	(0.160)	(0.155)	(0.151)	(0.158)	(0.149)
Disengaged	-0.727***	-0.551***	-0.757***	-0.828***	-1.115***	-0.621***
	(0.183)	(0.206)	(0.203)	(0.193)	(0.199)	(0.203)
Doubtful	-2.832***	-1.927***	-2.831***	-2.511***	-2.076***	-1.991***
	(0.389)	(0.353)	(0.391)	(0.360)	(0.316)	(0.363)
Political orientation	0.00544	-0.0188	0.0183	-0.00806	-0.00124	-0.0394*
(right)	(0.0219)	(0.0215)	(0.0220)	(0.0220)	(0.0217)	(0.0218)
Trust in political	0.383***	0.0277	0.305***	0.349***	0.134**	0.0117
parties	(0.0530)	(0.0527)	(0.0548)	(0.0520)	(0.0527)	(0.0491)
Risk averse	-0.170*	0.187*	-0.282***	-0.0448	0.0242	0.223**
	(0.0940)	(0.0961)	(0.0984)	(0.0937)	(0.0974)	(0.0952)
Primarily motorized	-0.537***	0.117	-0.316***	-0.699***	-0.436***	-0.323***
transport	(0.101)	(0.101)	(0.100)	(0.0990)	(0.101)	(0.0994)
Sociodemographic Controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	1,654	1,654	1,654	1,654	1,654	1,654
Pseudo R^2	0.106	0.0628	0.0969	0.0961	0.0768	0.0689
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1						

Acceptability of carbon pricing policies by audience segments



Acceptability of carbon pricing policies by audience segments

Models	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Carbon pricing	Carbon pricing package	Climate mitigation investments	Climate adaptation investments	Reducing labour taxes	Reducing VAT
Alarmed	1.627***	0.869***	1.757***	2.105***	0.276	0.271
	(0.288)	(0.252)	(0.275)	(0.281)	(0.302)	(0.298)
Concerned	0.539***	0.482***	0.516***	0.785***	-0.0427	0.00609
	(0.175)	(0.163)	(0.164)	(0.166)	(0.168)	(0.164)
Disengaged	-0.343	-0.345*	-0.404*	-0.293	-0.416**	-0.251
	(0.210)	(0.205)	(0.212)	(0.220)	(0.209)	(0.206)
Doubtful	-1.810***	-1.484***	-1.730***	-1.207***	-0.0132	0.190
	(0.369)	(0.366)	(0.351)	(0.347)	(0.310)	(0.352)
Perceived effectiveness	0.216***	0.253***	0.123**	0.0983	0.00467	-0.0298
	(0.0654)	(0.0619)	(0.0586)	(0.0647)	(0.0626)	(0.0601)
Perceived fairness	1.241***	0.563***	0.255***	0.193***	0.113*	0.0263
	(0.0830)	(0.0727)	(0.0624)	(0.0648)	(0.0614)	(0.0612)
Financial impact own	0.346***	0.119*	0.111*	0.0368	-0.0210	-0.00888
	(0.0750)	(0.0651)	(0.0657)	(0.0718)	(0.0626)	(0.0661)
Knowledge carbon pricing	0.0940*	0.145***	0.0529	0.119**	-0.0210	-0.0467
	(0.0541)	(0.0533)	(0.0533)	(0.0510)	(0.0526)	(0.0521)
Political orientation	-0.00659	-0.00466	-0.0650***	-0.0141	-0.00979	0.0164
(right)	(0.0230)	(0.0239)	(0.0230)	(0.0235)	(0.0225)	(0.0235)
Trust in political parties	0.0754	-0.105**	-0.0747	-0.122**	-0.176***	-0.0919
	(0.0584)	(0.0535)	(0.0524)	(0.0568)	(0.0550)	(0.0582)
Risk averse	0.0431	0.0286	0.199**	0.297***	0.0695	0.0131
	(0.103)	(0.100)	(0.101)	(0.104)	(0.0967)	(0.100)
Primarily motorized	-0.352***	-0.0304	-0.608***	-0.116	0.263**	-0.00383
transport	(0.108)	(0.104)	(0.110)	(0.109)	(0.109)	(0.101)
Sociodemographic controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	1,552	1,552	1,552	1,552	1,552	1,552
Pseudo R^2	0.271	0.113	0.0939	0.0779	0.0118	0.0155
Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1						

Can revenue recycling help to find common ground?

- Revenue recycling can be an important mechanism to increase acceptability of carbon pricing policies.
- Earmarking carbon pricing revenues for environmental purposes might result in “preaching to the converted”, while a carbon pricing shift that uses revenues to reduce other taxes could help to make these policies acceptable for the Doubtful and Disengaged segment.
- Climate audience segments significantly predict support for climate policies. The disparity in support is most pronounced for coercive policies (taxation, banning).
- Identifying and understanding climate subgroups and their preferences regarding climate policies offers new insights. This could help to develop and implement effective climate policies.

3. Survey 2: discrete choice experiment

Survey 1

- Exploring attitudes towards carbon pricing and climate policies among the general population and across subgroups.
- Investigating the drivers of acceptability - with a focus on revenue recycling.

Survey 2 - research questions

- If one of the proposed CO2 pricing packages would be implemented, which package would citizens prefer? How can attributes and other drivers explain this choice?
- What is the effect of providing information on the impacts of policy packages?
    - Information on financial impact on own household, financial impact on low-income households, average financial impact on households, employment, emission reduction, …

Survey 2: discrete choice experiment

Carbon pricing package = CO2-price + revenue recycling

Carbon price

TARGET: 114 euro per tonne for ETS-2 sector and about 112 euro per tonne for ETS-1 in 2030. Carbon prices that maximally approach the national Effort Sharing Regulation target, as well as reach net zero in 2050.

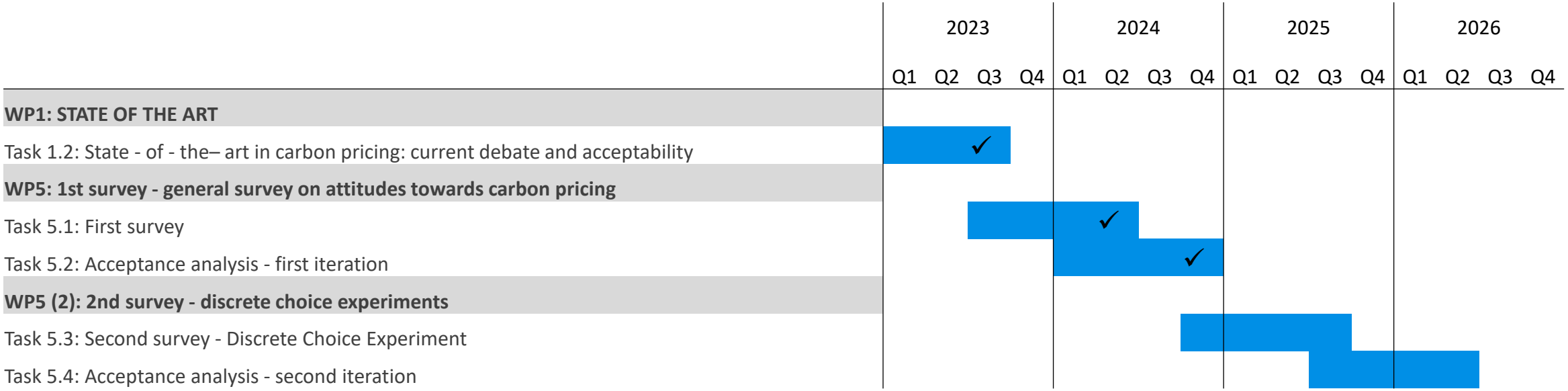
Revenue recycling

- Linear labour tax reduction (~ *efficiency*)
- Low-wage tax rate reduction (OR low skilled wage tax rate reduction)
- Lump sum transfer (~ *equity*)
- Subsidies for public transport & linear labour tax reduction (~ *public acceptability*)
- Hardest hit household credit (targeted transfers to most affected groups)

Survey 2: discrete choice experiment

Attribute	Levels
CO2-price (cost)	Around 112-114 euro per tonne CO2 (depending on revenue recycling)
Revenue use (benefit)	Labour tax reductions, Lump-sum, Targeted transfers, …
Information on financial impact on own household (agent-specific based on sociodemographic and energy characteristics)	No information, Detailed information: X euro/month
Information on financial impact on low-income households	No information, Detailed information: X euro/month
Information on general economic impact (financial impact on average)	No information, Detailed information: X euro/month
Information on employment (agent-specific based on skill level?)	No information, Detailed information
Information on emission reductions	No information, Detailed information: - X % (constant emission reductions)

Planning


2023
2024
2025
2026
Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4
WP1: STATE OF THE ART
Task 1.2: State - of - the– art in carbon pricing: current debate and acceptability
WP5: 1st survey - general survey on attitudes towards carbon pricing
Task 5.1: First survey
Task 5.2: Acceptance analysis - first iteration
WP5 (2): 2nd survey - discrete choice experiments
Task 5.3: Second survey - Discrete Choice Experiment
Task 5.4: Acceptance analysis - second iteration

THANK YOU

KU LEUVEN

H:VA