

Leveraging EU indirect tax systems to align food prices and climate policy in an equitable way

B. Capéau^{1,3}, I.P. Dominguez², A. Decoster³, J. Hristov²,
S. Maier², M. Ricci², T. Vandyck² & S. Van Houtven³

¹Free University of Brussels, ECARES, Belgium

²European Commission, Joint Research Centre, Seville, Spain

³KU Leuven, Department of Economics, Belgium

Preliminary results – do not quote or cite without permission of the authors.

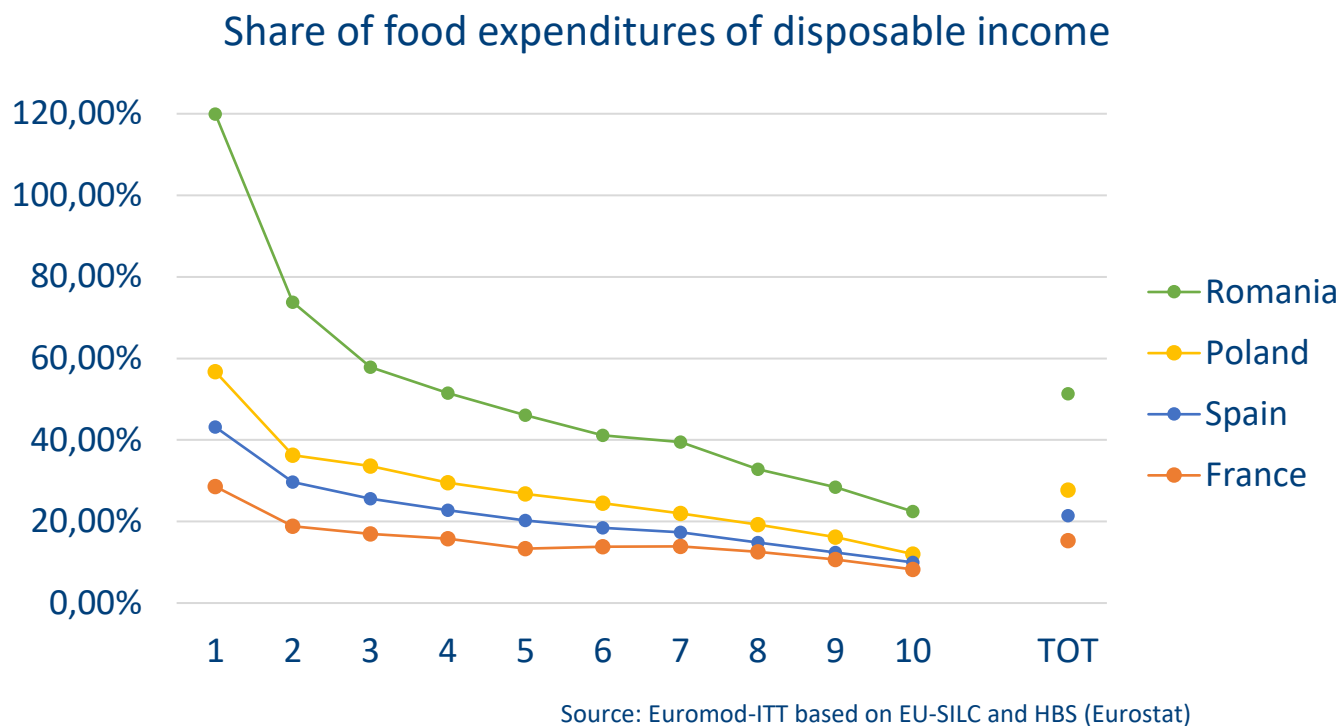
- Motivation
- Methodology
- Scenarios for Greening food taxation
 - Distributional impact
- Scenarios for Greening food taxation with revenue recycling
 - Distributional impact
- Discussion

- **Motivation**
- Methodology
- Scenarios for Greening food taxation
 - Distributional impact
- Scenarios for Greening food taxation with revenue recycling
 - Distributional impact
- Discussion

- Food systems
 - 1/3th of global anthropogenic greenhouse gas emissions (Crippa et al., 2021)
 - Environment-harming dietary choices also unhealthy (Springmann et al., 2016)
- Rationale for pricing externalities
 - Agriculture largely uncovered by emission trading systems (current + proposed)
 - Alternatively: adapt current indirect tax systems
- Farm to Fork strategy (European Green Deal)
 - “[...] aiming to make food systems fair, healthy and environmentally-friendly.”

- But, acceptability and fairness?

- Risking accessibility and affordability of food for low-income households
- Higher share of budget spent on food by most vulnerable households



- Also, perceived unfairness of tax reforms may hamper acceptability

- Therefore, we study

- The distributional consequences of
- Consumer price changes following the introduction of a tax on emissions,
- and a VAT-reform with higher taxes on emission-intensive food
- including possible compensation mechanisms,
- in four European countries (Spain, France, Romania, Poland),
- with:
 - CAPRI
 - Partial equilibrium agricultural model
 - EUROMOD with Indirect Tax Tool
 - Covering the diversity in tax systems
 - Covering heterogeneity in (emission intensities of) dietary patterns
 - Capturing heterogeneous impacts across different households.

- Motivation
- **Methodology**
- Scenarios for Greening food taxation
 - Distributional impact
- Scenarios for Greening food taxation with revenue recycling
 - Distributional impact
- Discussion

- Uniform global tax on GHG emissions simulated in CAPRI
 - consumer price changes
- Distributional impact of several scenarios simulated in EUROMOD with Indirect Tax Tool (version of 2021)
 - Based on EU-SILC 2010
 - Enriched with EU-HBS 2010 (predictive mean matching, Akoguz et al. 2020)
 - Adapted to be able to model directly a consumer price change
- No simulation of behavior on the micro-level
- “Welfare effect”
 - The extra amount of euros spent to keep the same consumption basket,
 - minus the euros compensation received (if that is the case),
 - (divided by baseline disposable income).

- Motivation
- Methodology
- **Scenarios for Greening food taxation**
 - Distributional impact
- Scenarios for Greening food taxation with revenue recycling
 - Distributional impact
- Discussion

- Introduction of a tax on greenhouse gas emissions
 - Consumer price changes simulated in CAPRI
 - We use these price changes exogenously in EM-ITT

	Spain	France	Poland	Romania
Sheep and goat meat	53.6%	46.4%	50.8%	54.5%
Beef	40.2%	32.4%	38.1%	39.7%
Pork meat	5.8%	5.0%	6.1%	6.5%
Poultry meat	5.2%	4.9%	5.0%	4.8%
Rice	2.2%	1.9%	3.9%	4.3%
Eggs	2.0%	1.8%	2.3%	2.8%
Milk and cheese	1.7%	1.7%	1.6%	1.9%
Fish and seafood	1.3%	1.3%	1.9%	1.9%
Vegetables	0.5%	0.5%	0.8%	0.9%
Bread and cereals	0.5%	0.4%	0.8%	1.2%
Fruit	0.4%	0.4%	0.5%	0.6%
Potatoes	0.2%	0.1%	0.2%	0.2%
Oils and fat	0.5%	0.9%	0.3%	0.4%
Sugar	0.1%	0.1%	0.2%	0.4%

Source: consumer price changes simulated in CAPRI

- Increased VAT-rates of emission-intensive goods

- New rates depend on the emission intensity of the food category
- New rates depend on the existing VAT-rates on food in the resp. country

	Spain		France		Poland		Romania	
	Current	New	Current	New	Current	New	Current	New
Sheep and goat meat	10.0	45.0	5.5	45.0	5.0	45.0	9.0	45.0
Beef	10.0	45.0	5.5	45.0	5.0	45.0	9.0	45.0
Pork meat	10.0	12.0	5.5	10.0	5.0	10.0	9.0	12.0
Poultry meat	10.0	12.0	5.5	10.0	5.0	10.0	9.0	12.0
Rice	4.0	4.0	5.5	8.0	5.0	8.0	9.0	12.0
Eggs	10.0	12.0	5.5	8.0	5.0	8.0	9.0	12.0
Milk and cheese	10.0	12.0	5.5	8.0	5.0	8.0	9.0	12.0
Fish and seafood	10.0	12.0	5.5	8.0	5.0	8.0	9.0	12.0
Vegetables	4.0	4.0	5.5	5.5	5.0	5.0	9.0	9.0
Bread and cereals	4.0	4.0	5.5	5.5	5.0	5.0	9.0	9.0
Fruit	4.0	4.0	5.5	5.5	5.0	5.0	9.0	9.0
Potatoes	4.0	4.0	5.5	5.5	5.0	5.0	9.0	9.0
Oils and fat	10.0	10.0	5.5	5.5	23.0	23.0	9.0	9.0
Sugar	10.0	10.0	5.5	5.5	8.0	8.0	9.0	9.0

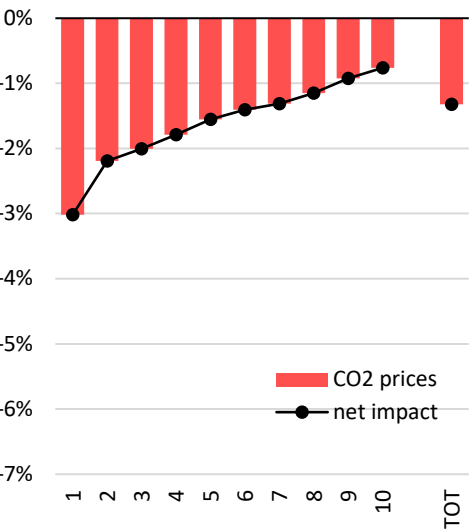
SCENARIOS FOR GREENING FOOD TAXATION

	Feasibility	Environmental impact	Tax revenue	Distributional impact
1) Global GHG tax	- - -	+ + + +	+ + +	- - -
2) Increased VAT-rates	+	+ + + (?)	+ + (?)	- - - (?)

- Motivation
- Methodology
- **Scenarios for Greening food taxation**
 - Distributional impact
- Scenarios for Greening food taxation with revenue recycling
 - Distributional impact
- Discussion

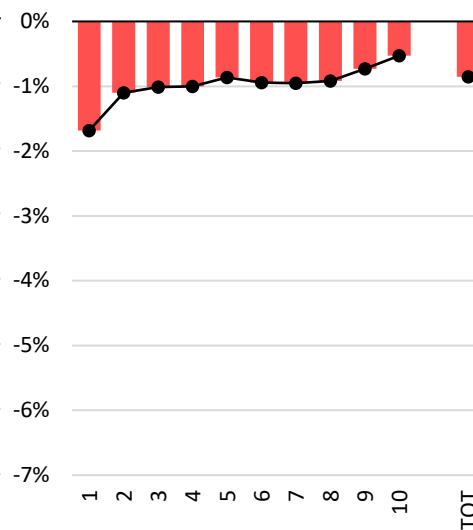
DISTRIBUTIONAL IMPACT

Spain

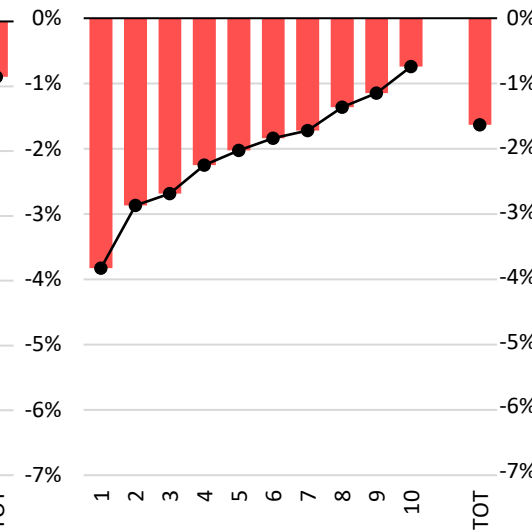


France

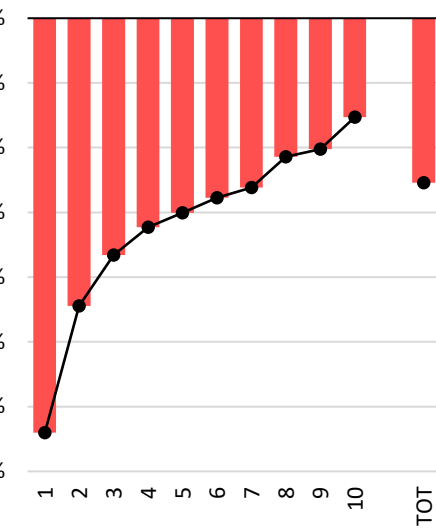
CO2-equivalent taxation



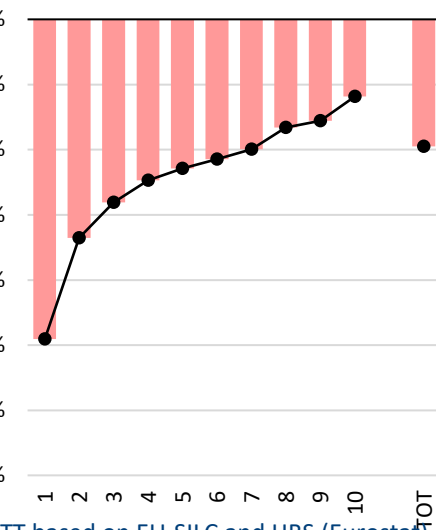
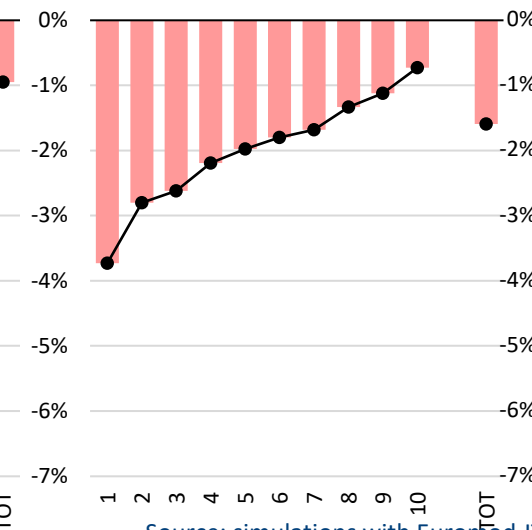
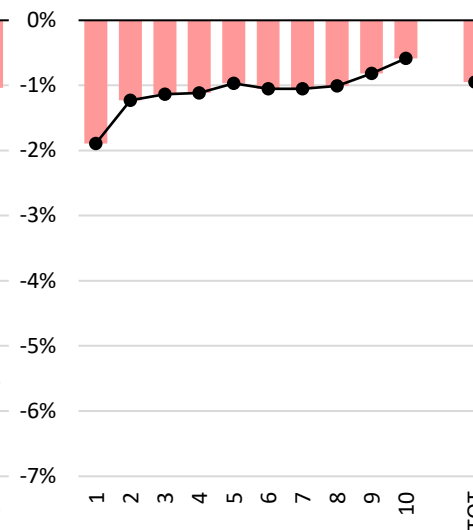
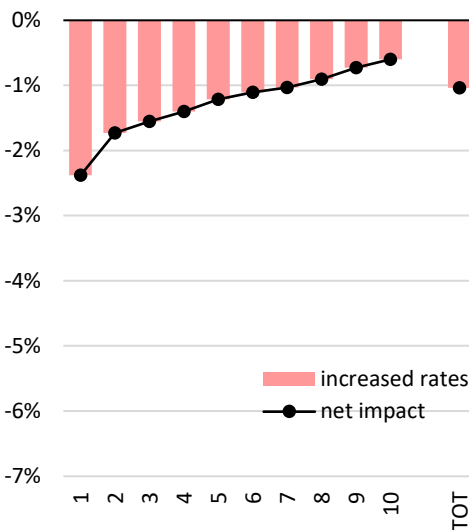
Poland



Romania



Increased VAT-rates on emission-intensive goods



Source: simulations with Euromod-ITT based on EU-SILC and HBS (Eurostat)

DISTRIBUTIONAL IMPACT

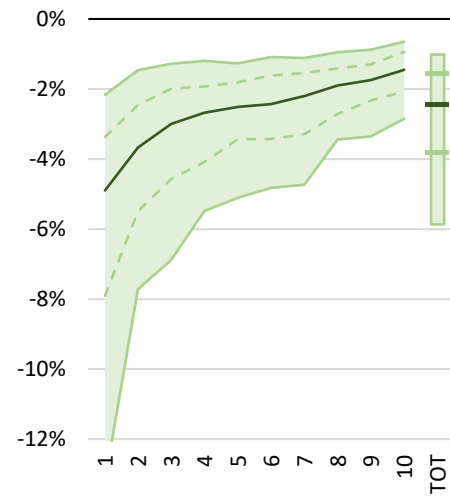
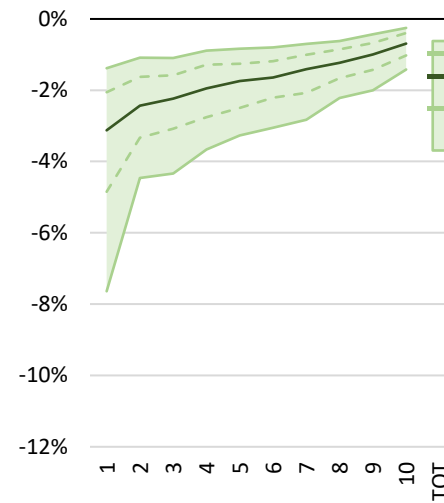
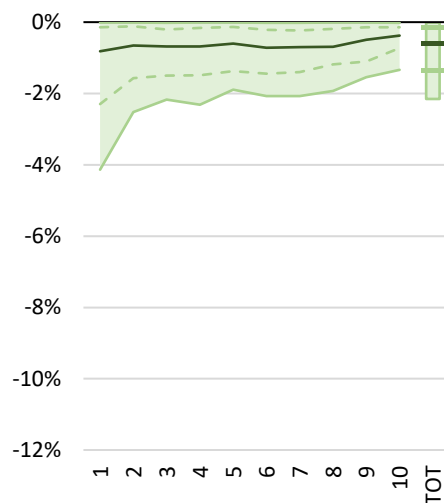
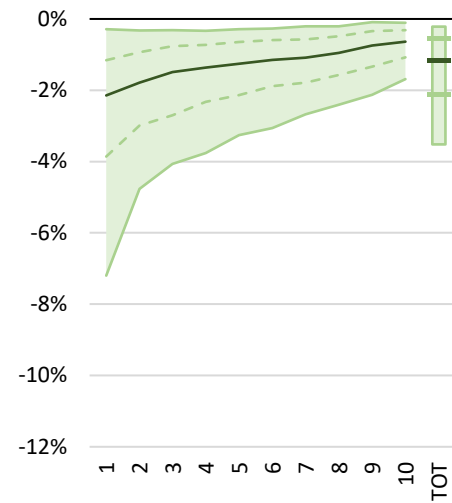
Spain

France

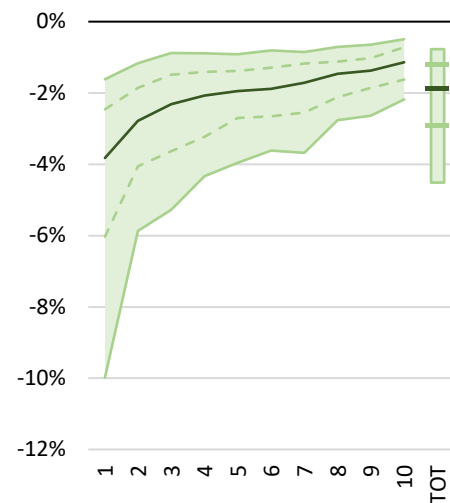
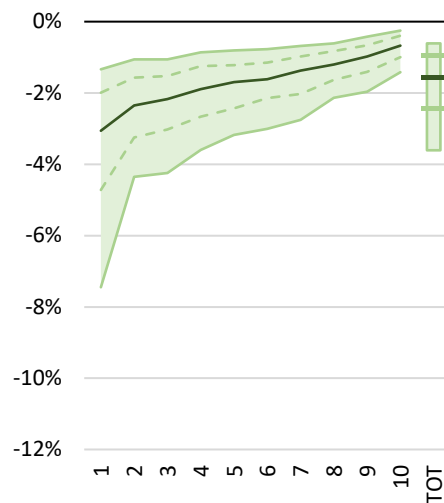
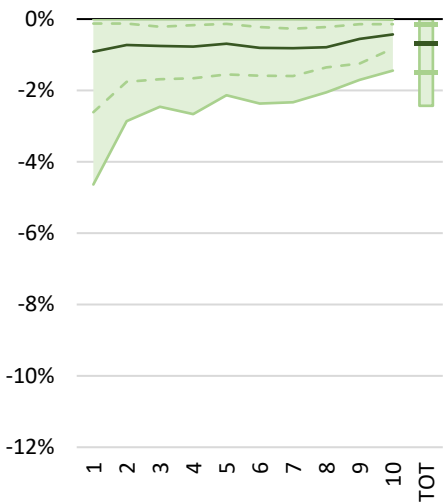
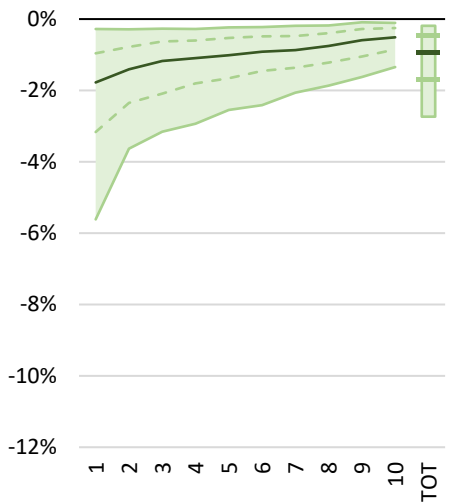
Poland

Romania

CO2-equivalent taxation

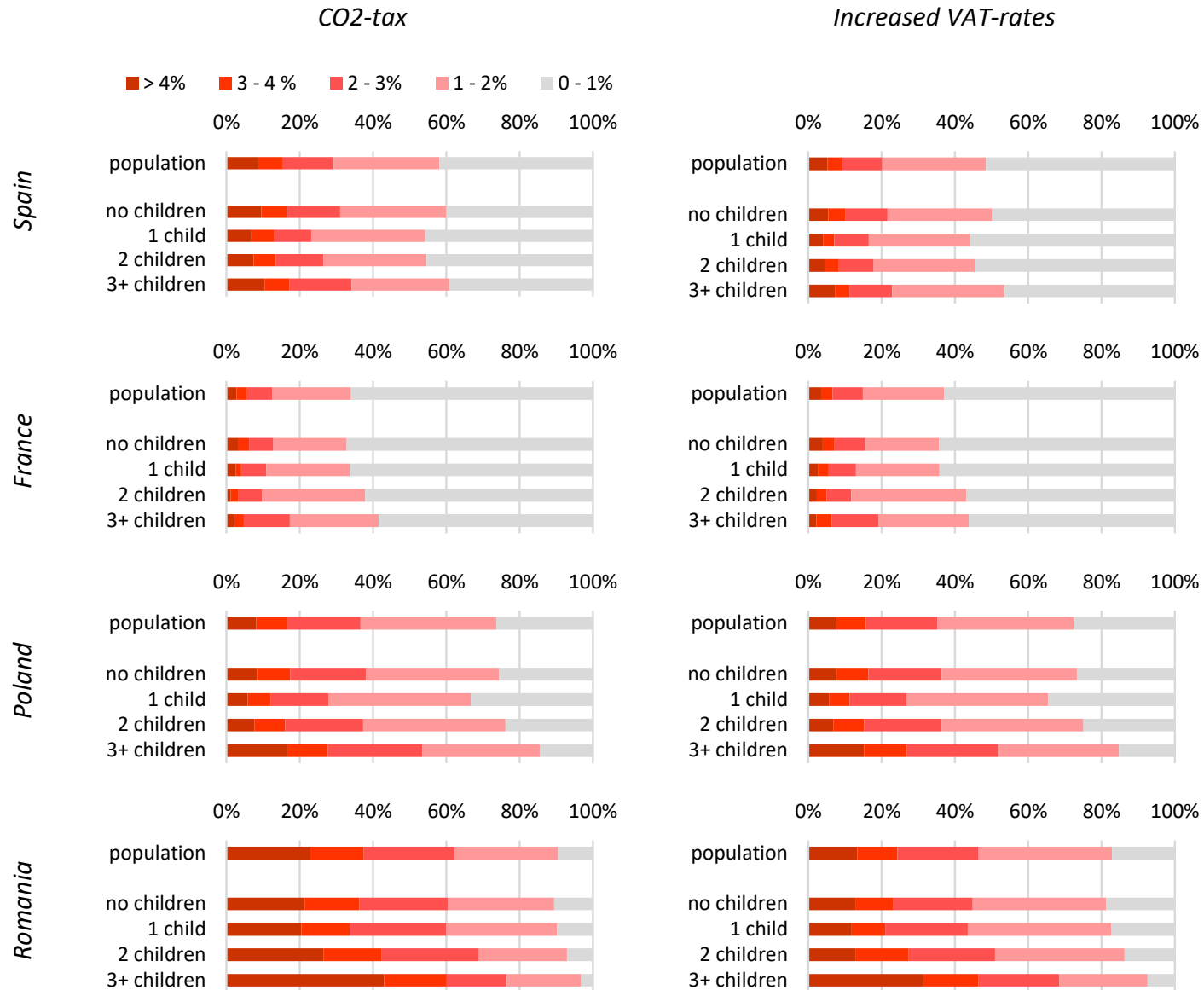


Increased VAT-rates on emission-intensive goods



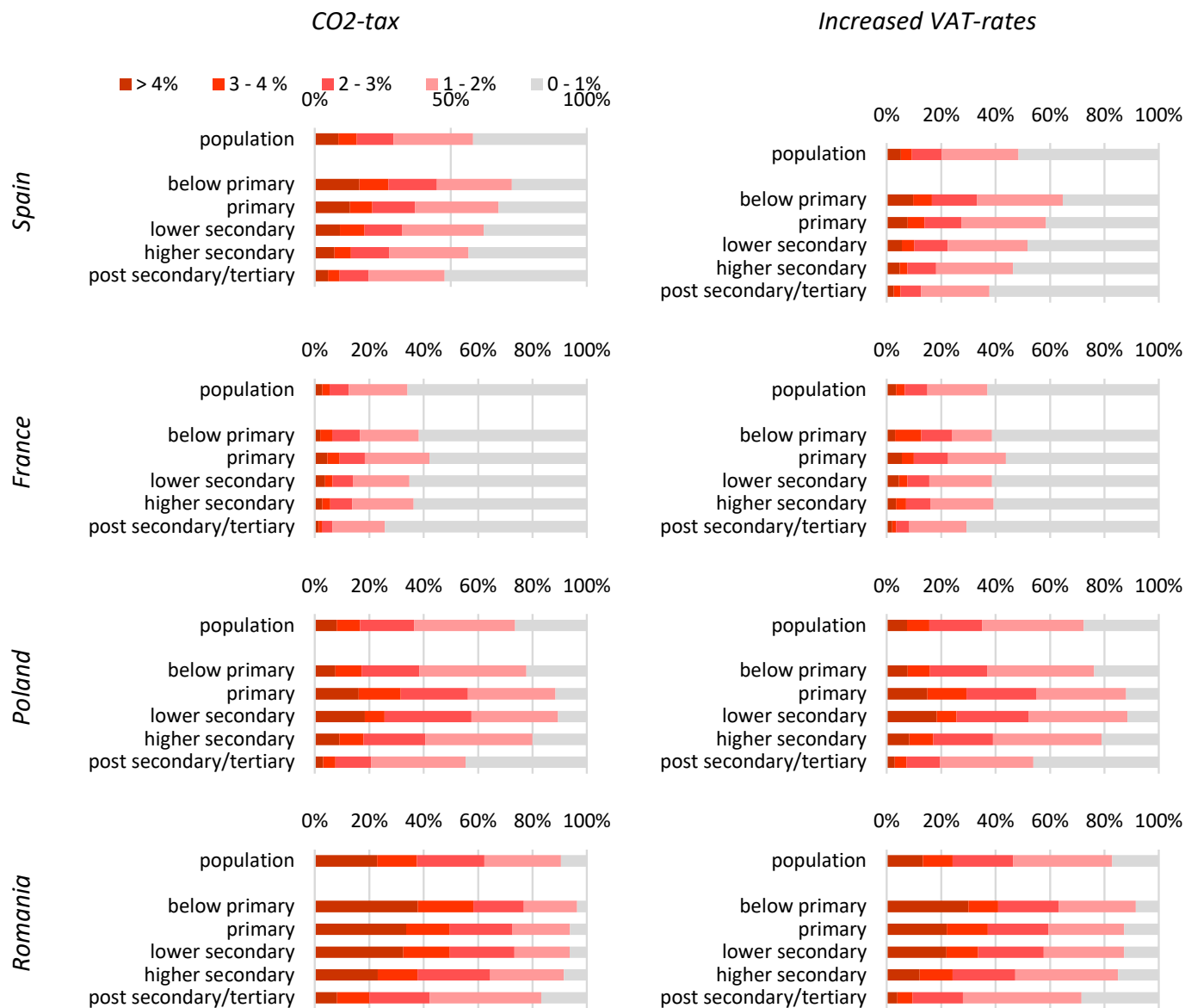
Source: simulations with Euromod-ITT based on EU-SILC and HBS (Eurostat)

DISTRIBUTIONAL IMPACT



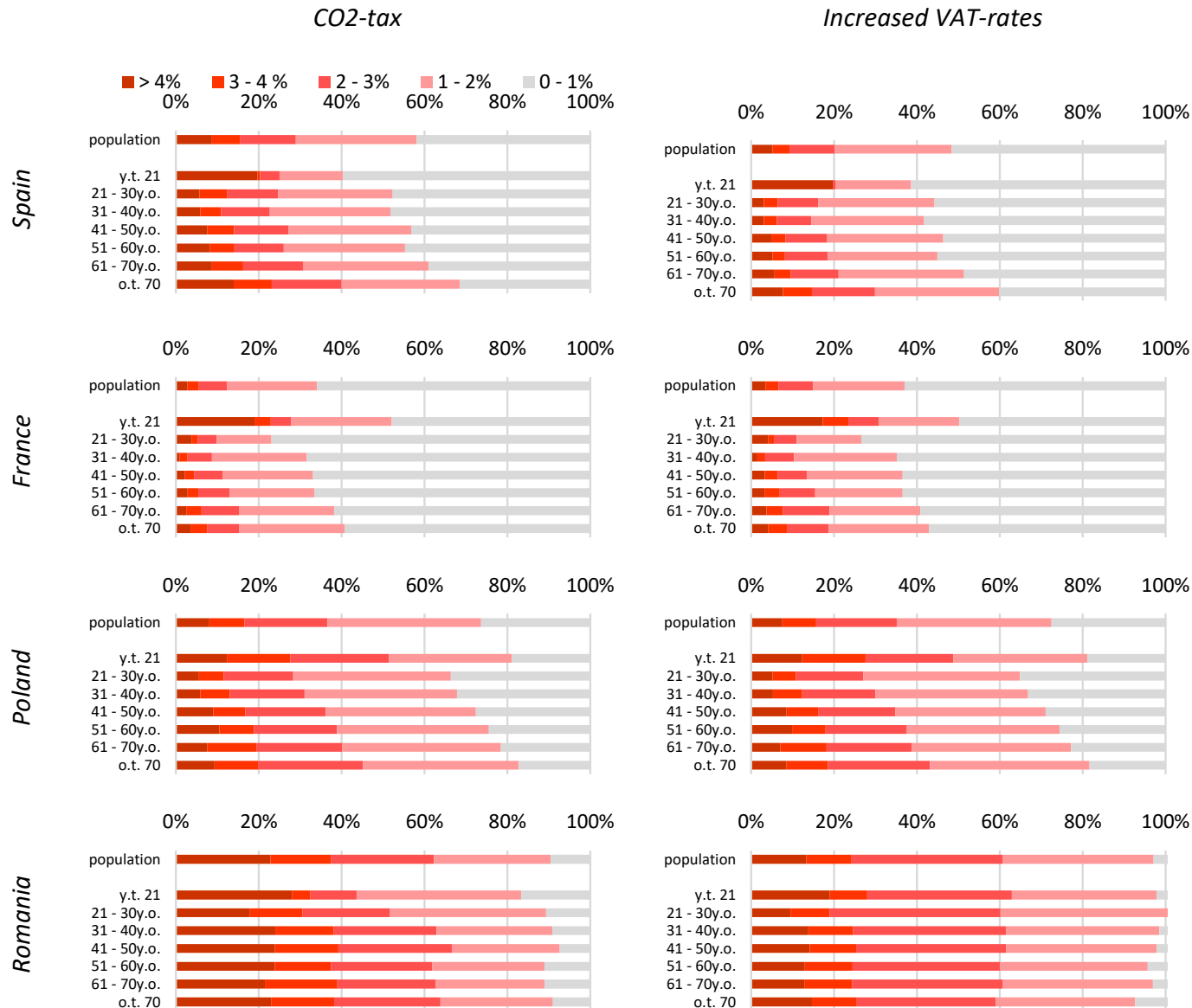
Source: simulations with Euromod-ITT based on EU-SILC and HBS (Eurostat)

DISTRIBUTIONAL IMPACT



Source: simulations with Euromod-ITT based on EU-SILC and HBS (Eurostat)

DISTRIBUTIONAL IMPACT



Source: simulations with Euromod-ITT based on EU-SILC and HBS (Eurostat)

- Motivation
- Methodology
- Scenarios for Greening food taxation
 - Distributional impact
- **Scenarios for Greening food taxation with revenue recycling**
 - Distributional impact
- Discussion

- Balanced VAT rates

- Lowered VAT rates for low emission-intensive food categories with revenue from increased rates.
- Translates into subsidies for food products with low emission-intensity.

	Spain		France		Poland		Romania	
	Current	New	Current	New	Current	New	Current	New
Sheep and goat meat	10.0	45.0	5.5	45.0	5.0	45.0	9.0	45.0
Beef	10.0	45.0	5.5	45.0	5.0	45.0	9.0	45.0
Pork meat	10.0	12.0	5.5	10.0	5.0	10.0	9.0	12.0
Poultry meat	10.0	12.0	5.5	10.0	5.0	10.0	9.0	12.0
Rice	4.0	4.0	5.5	8.0	5.0	8.0	9.0	12.0
Eggs	10.0	12.0	5.5	8.0	5.0	8.0	9.0	12.0
Milk and cheese	10.0	12.0	5.5	8.0	5.0	8.0	9.0	12.0
Fish and seafood	10.0	12.0	5.5	8.0	5.0	8.0	9.0	12.0
Vegetables	4.0	-14.5	5.5	-17.0	5.0	-17.5	9.0	-5.5
Bread and cereals	4.0	-14.5	5.5	-17.0	5.0	-17.5	9.0	-5.5
Fruit	4.0	-14.5	5.5	-17.0	5.0	-17.5	9.0	-5.5
Potatoes	4.0	-14.5	5.5	-17.0	5.0	-17.5	9.0	-5.5
Oils and fat	10.0	-14.5	5.5	-17.0	23.0	-17.5	9.0	-5.5
Sugar	10.0	-14.5	5.5	-17.0	8.0	-17.5	9.0	-5.5

- Increased VAT-rates and lump sum transfer

- Increased VAT-rates of high emission-intensive goods, and revenue recycling with lump sum transfer to each individual (including children)

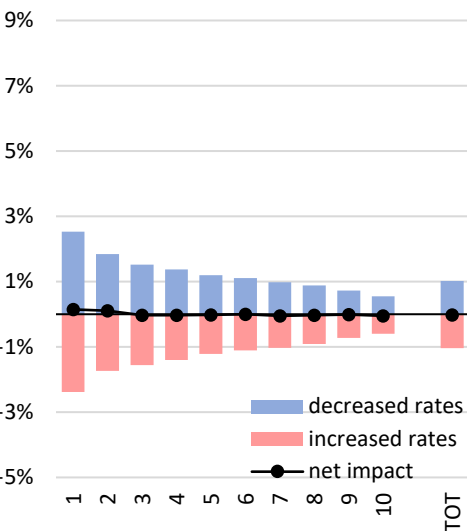
	Spain		France		Poland		Romania	
	Current	New	Current	New	Current	New	Current	New
Sheep and goat meat	10.0	45.0	5.5	45.0	5.0	45.0	9.0	45.0
Beef	10.0	45.0	5.5	45.0	5.0	45.0	9.0	45.0
Pork meat	10.0	12.0	5.5	10.0	5.0	10.0	9.0	12.0
Poultry meat	10.0	12.0	5.5	10.0	5.0	10.0	9.0	12.0
Rice	4.0	4.0	5.5	8.0	5.0	8.0	9.0	12.0
Eggs	10.0	12.0	5.5	8.0	5.0	8.0	9.0	12.0
Milk and cheese	10.0	12.0	5.5	8.0	5.0	8.0	9.0	12.0
Fish and seafood	10.0	12.0	5.5	8.0	5.0	8.0	9.0	12.0
Vegetables	4.0	4.0	5.5	5.5	5.0	5.0	9.0	9.0
Bread and cereals	4.0	4.0	5.5	5.5	5.0	5.0	9.0	9.0
Fruit	4.0	4.0	5.5	5.5	5.0	5.0	9.0	9.0
Potatoes	4.0	4.0	5.5	5.5	5.0	5.0	9.0	9.0
Oils and fat	10.0	10.0	5.5	5.5	23.0	23.0	9.0	9.0
Sugar	10.0	10.0	5.5	5.5	8.0	8.0	9.0	9.0
Lump sum transfer		9.30		13.57		5.97		4.29

	Feasibility	Environmental impact	Tax revenue	Distributional impact
1) Global GHG tax	- - -	+ + + +	+ + +	- - -
2) Increased VAT-rates	+	+ + + (?)	+ + (?)	- - -
3) Balanced VAT-rates	++	++	0	-/+ (?)
4) Increased VAT-rates & compensated with <u>lumpsum-transfer</u>	++	+	0	+ (?)

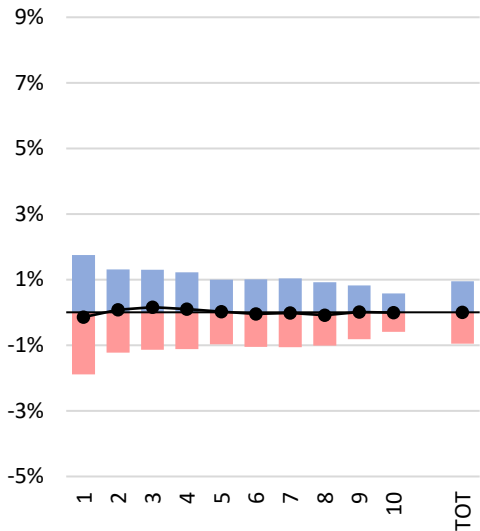
- Motivation
- Methodology
- Scenarios for Greening food taxation
 - Distributional impact
- **Scenarios for Greening food taxation with revenue recycling**
 - Distributional impact
- Discussion

DISTRIBUTIONAL IMPACT

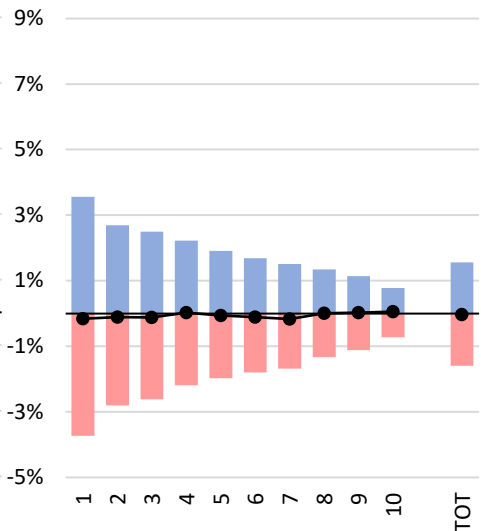
Spain



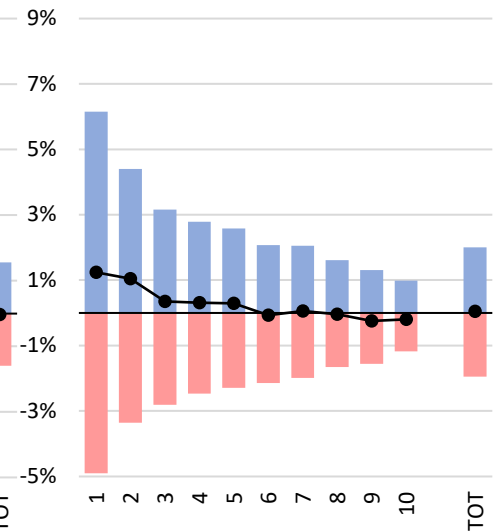
France



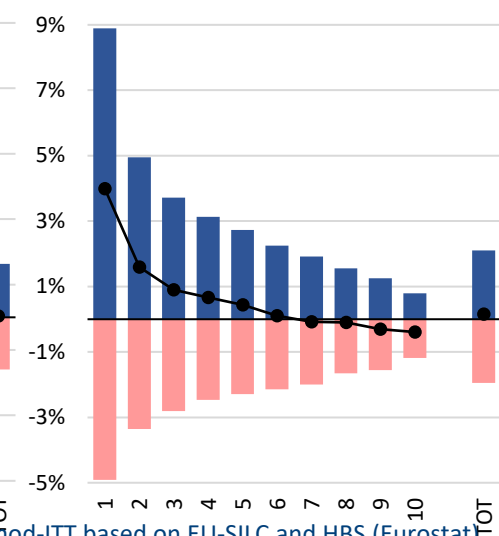
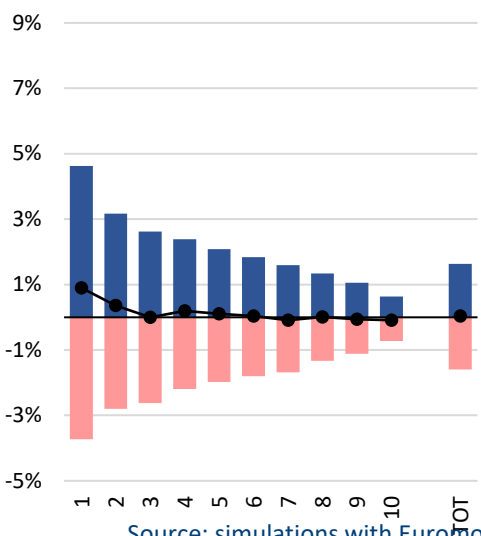
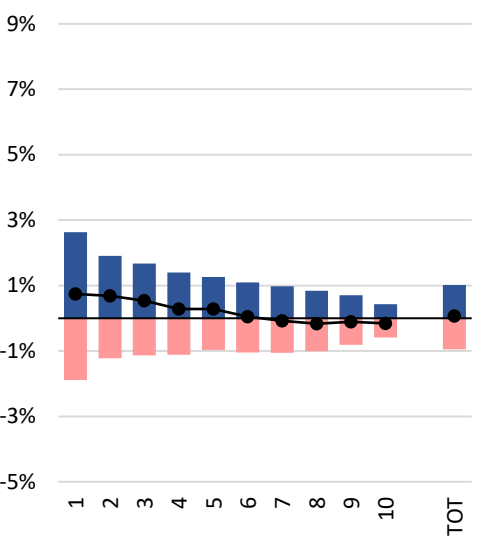
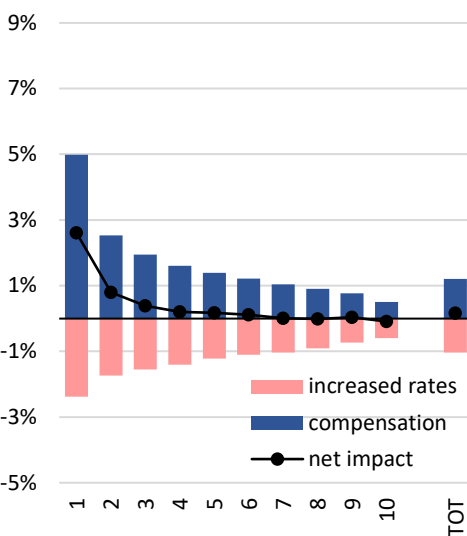
Poland



Romania



Increased VAT-rates and lump sum transfer



Source: simulations with Euromod-ITT based on EU-SILC and HBS (Eurostat)

DISTRIBUTIONAL IMPACT

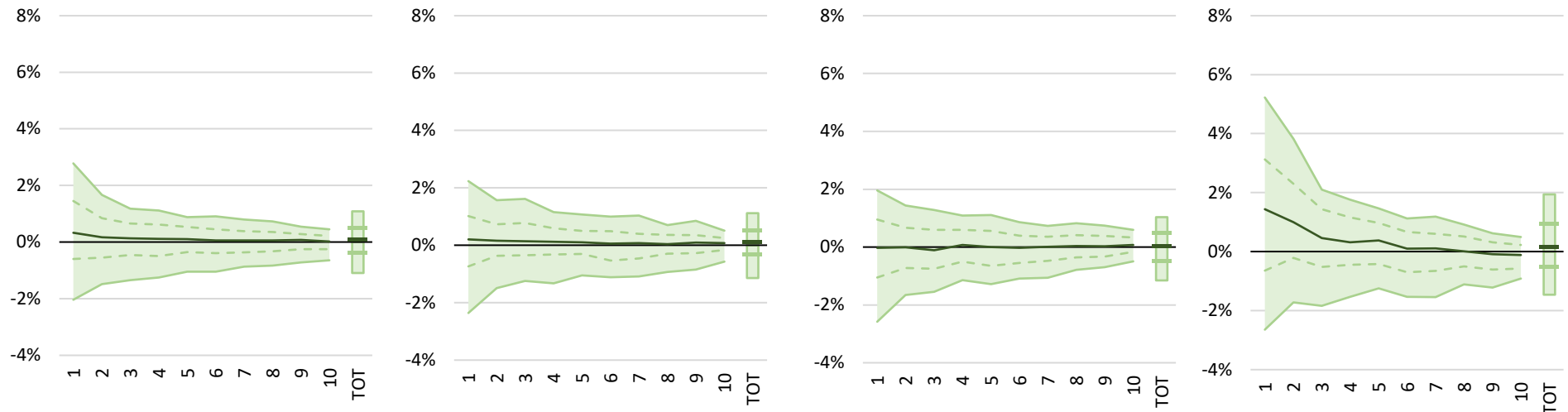
Spain

France

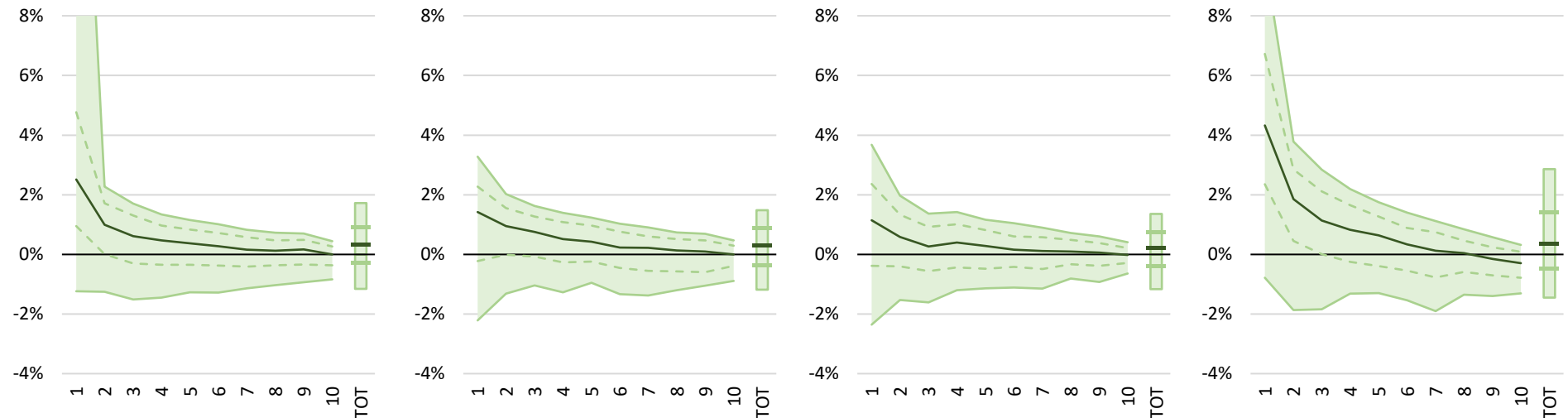
Poland

Romania

Balanced VAT-rates

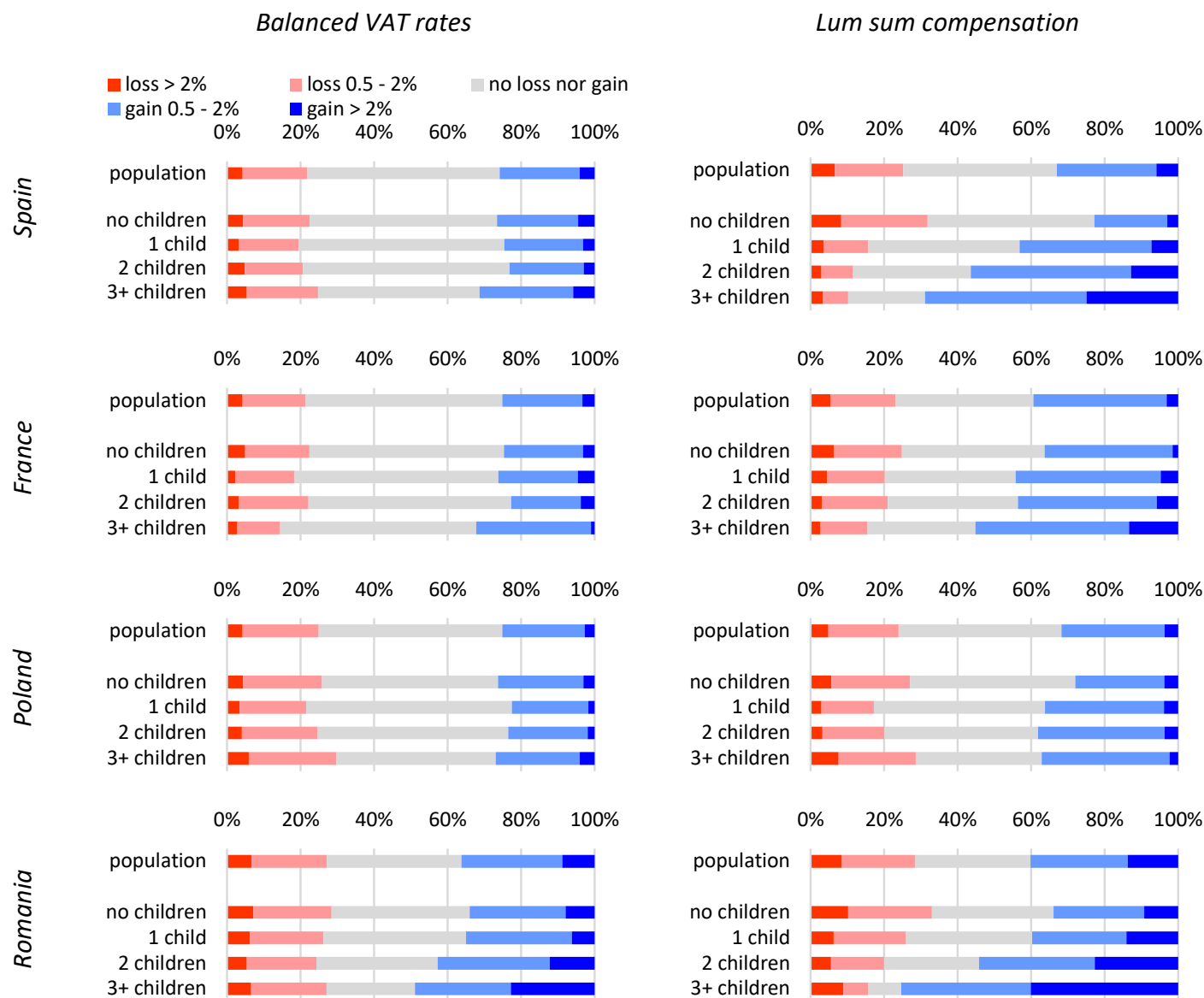


Increased VAT-rates and lump sum transfer



Source: simulations with Euromod-ITT based on EU-SILC and HBS (Eurostat)

DISTRIBUTIONAL IMPACT

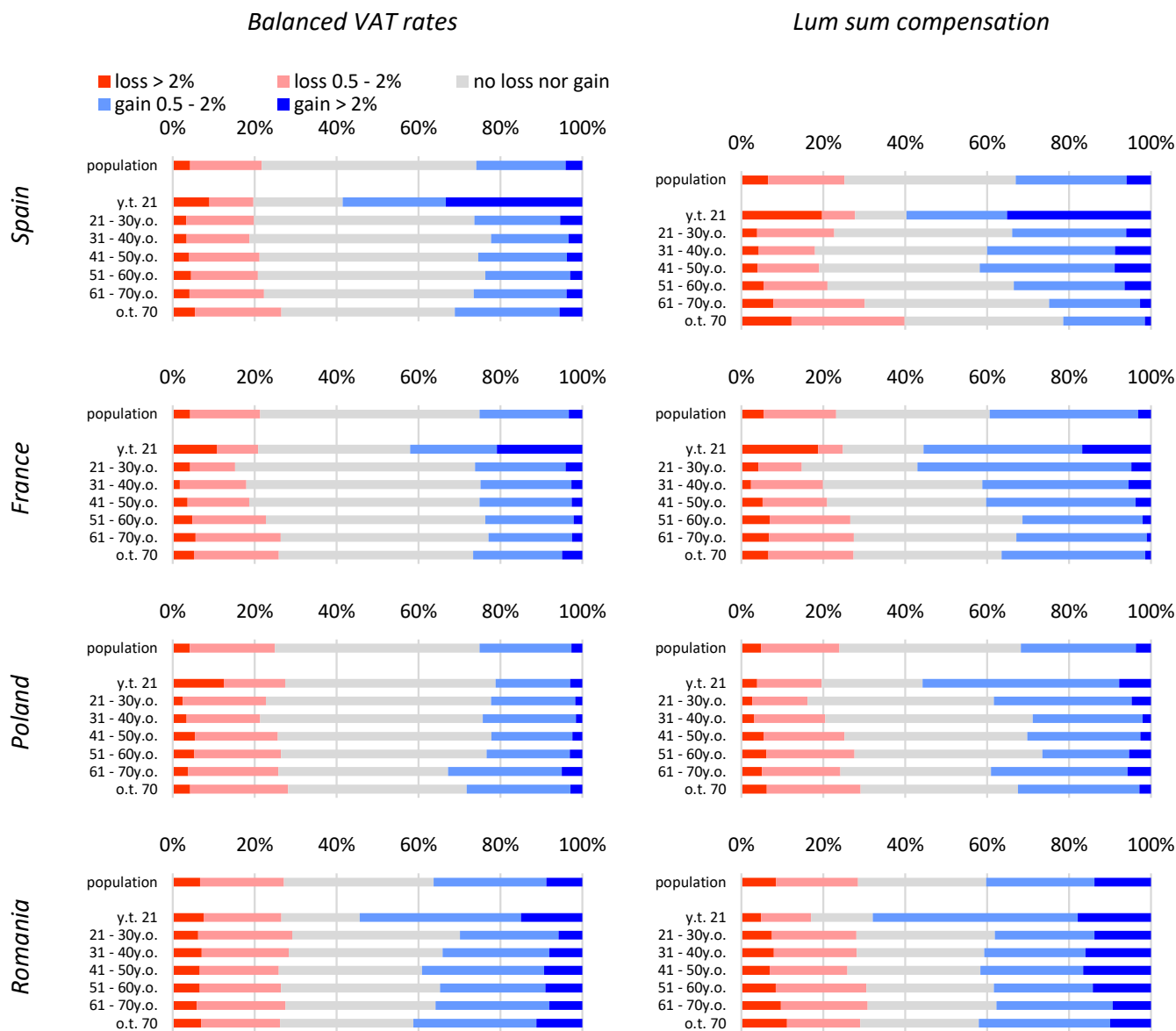


Source: simulations with Euromod-ITT based on EU-SILC and HBS (Eurostat)

KU LEUVEN
FACULTEIT ECONOMIE EN
BEDRIJFSWETENSCHAPPEN



DISTRIBUTIONAL IMPACT



Source: simulations with Euromod-ITT based on EU-SILC and HBS (Eurostat)

- Motivation
- Methodology
- Scenarios for Greening food taxation
 - Distributional impact
- Scenarios for Greening food taxation with revenue recycling
 - Distributional impact
- **Discussion**

- Greenhouse gas emission tax & increase of VAT-rates
 - Large impact on low-income deciles
 - Especially in Romania and Poland
 - Low baseline incomes & dietary pattern
 - High frequency of large impact for low-educated households and older households
- Balanced VAT rates
 - Neutralizes the distributional effect of the VAT increase
 - Frequency of negative/positive impact equally distributed across household types
 - Still very much related to dietary pattern
- Lump sum transfer
 - Is more progressive reform,
 - Especially in Romania and Spain,
 - Highest positive impact for low incomes and large families

- Further work:

- Impact of the reforms on greenhouse gas emissions
 - Difference in GHG emission reduction between the explicit GHG tax and VAT reform?
 - Balanced VAT rates will have higher impact on GHG emissions, compared to lump sum transfer, but how much higher?
- Compensation mechanisms
 - Which are better targeted at households that lose,
 - Without distorting the incentives, and thus GHG emission reduction
 - That can raise acceptability.