



MAPPING TRADE TO HOUSEHOLD BUDGET SURVEY

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Webex*

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Overview

- Motivation
- Conversion framework
- Stylised example assessing household distribution impact of a tariff increase
- Limitations, caveats, & remaining issue



Motivation

- Important to understand the distributional effects of trade on household consumption
- Analytical challenges
 - Linking data under various nomenclature
 - Connecting models
 - Selecting metric to assess household impact
- Proposed framework
 - Converting METRO model trade policy simulations to distributional impact using household budget survey data



METRO model & HBS data

METRO trade model

- GTAP v10 database + OECD TiVA
- 65 sectors, 64 regions, and 8 factors
- Considerable degree of detail on prices

Household Budget Survey data

- European Household Budget Surveys (HBS)
- Classification of individual consumption by purpose (COICOP)
- 5 levels of detail



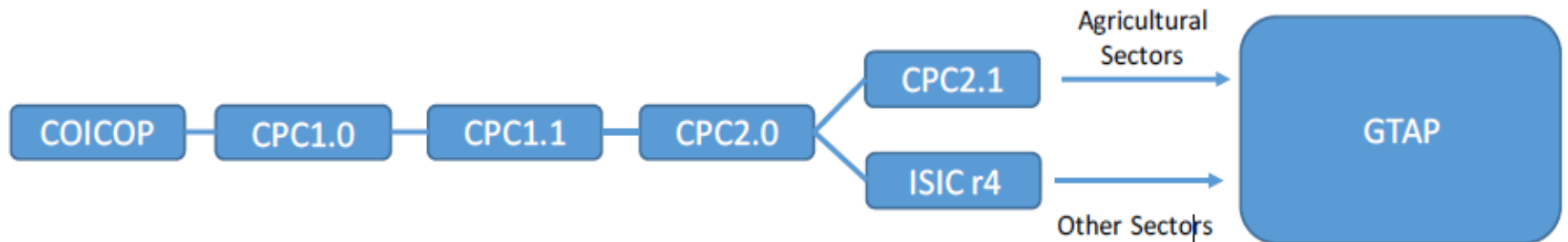
From CGE simulation to household impact

- Map GTAP sectors to COICOP classifications
- Convert consumer price changes from the CGE model to consumer price changes in household final consumption goods using a transition matrix



Conversion Framework

Mapping GTAP sector to Household budget survey (COICOP)





Conversion Framework

Concordance table

GTAP	COICOP
Bovine meat	Meat
Animal products	Meat
Meat products	Meat
Bovine meat	Animal drawn vehicles
Animal products	Animal drawn vehicles
Animal products	Household textile

Overlapping structure

GTAP categories	COICOP categories			
	Meat	Oils and fats	Household textile	Animal drawn vehicles
Bovine meat	1	0	0	1
Animal prod.	1	0	1	1
Meat prod.	1	0	0	0

Transition matrix

GTAP categories	COICOP categories			
	Meat	Oils and fats	Household textile	Animal drawn vehicles
Bovine meat	a_{11}	0	0	a_{14}
Animal prod.	a_{21}	0	a_{23}	a_{24}
Meat prod.	a_{31}	0	0	0



Transition matrix snapshot

GTAP categories	COICOP categories			
	Meat	Oils and fats	Household textile	Animal drawn vehicles
Bovine meat	a_{11}	0	0	a_{14}
Animal prod.	a_{21}	0	a_{23}	a_{24}
Meat prod.	a_{31}	0	0	0

- **Assumption 1: Homogeneity**

$$\Delta P(Bovine\ meat \cap Meat) = \Delta P(Bovine\ meat)$$



Transition matrix snapshot

GTAP categories	COICOP categories			
	Meat	Oils and fats	Household textile	Animal drawn vehicles
Bovine meat	a_{11}	0	0	a_{14}
Animal prod.	a_{21}	0	a_{23}	a_{24}
Meat prod.	a_{31}	0	0	0

- Assumption 2: Proportionality

$$\begin{aligned}\Delta P(\text{AD.Vehicles}) &= a_{14} \Delta P(\text{Bovine meat} \cap \text{AD.Vehicles}) \\ &= \frac{C(\text{Bovine meat})}{C(\text{Bovine meat}) + C(\text{Animal prod.})} \Delta P(\text{Bovine meat} \cap \text{AD.Vehicles}) \\ &= \frac{C(\text{Bovine meat})}{C(\text{Bovine meat}) + C(\text{Animal prod.})} \Delta P(\text{Bovine meat})\end{aligned}$$



Transition matrix snapshot

GTAP categories	COICOP categories			
	Meat	Oils and fats	Household textile	Animal drawn vehicles
Bovine meat	a_{11}	0	0	a_{14}
Animal prod.	a_{21}	0	1	$1 - a_{14}$
Meat prod.	$1 - a_{11} - a_{21}$	0	0	0



Assessing household distribution impact of a tariff increase: Example for France

- Expenditure approach:

$$\frac{CV_i}{C_i} = \frac{\sum_k q_k^i p_k * dp_k / p_k}{C_i} = \sum_k SC_k^i * \frac{dp_k}{p_k}$$

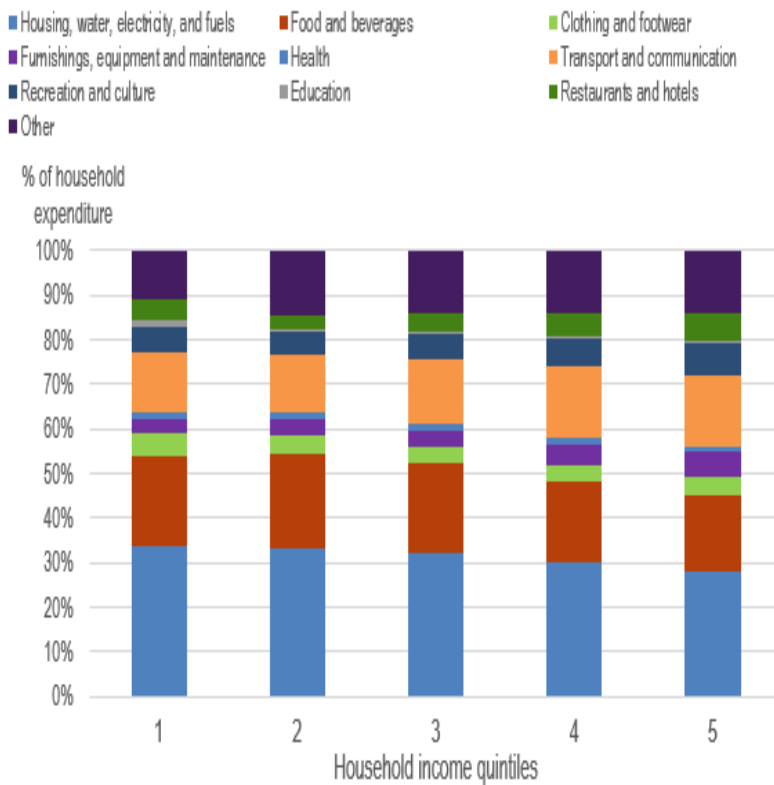
- Income approach:

$$\frac{CV_i}{Y_i} = \frac{\sum_k q_k^i p_k * dp_k / p_k}{Y_i} = \sum_k sy_k^i * \frac{dp_k}{p_k}$$

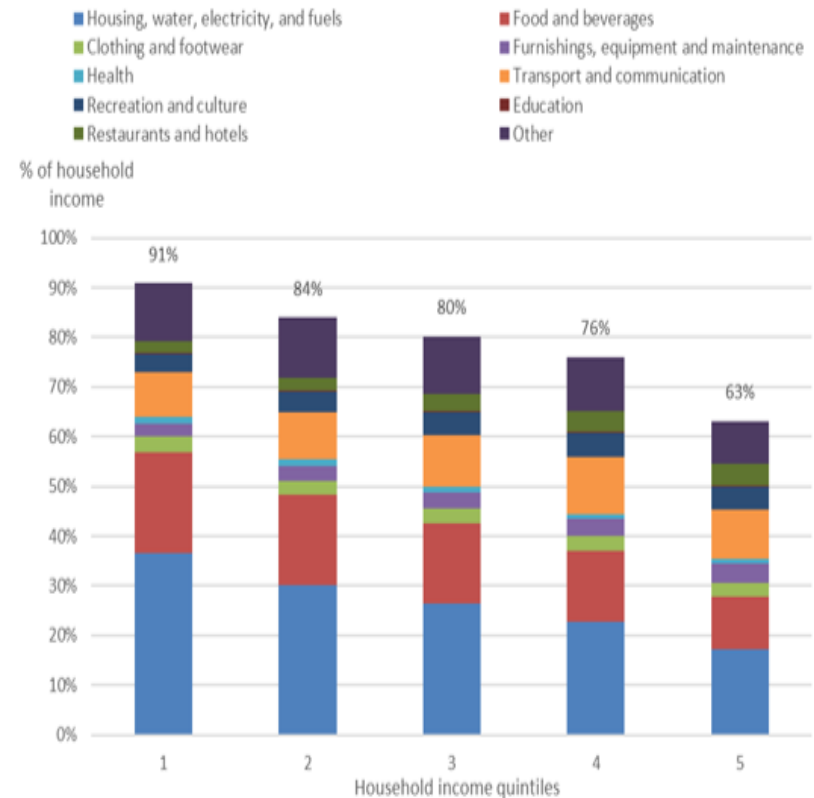


Expenditure shares by income quintiles: France – two approaches

Expenditure Approach



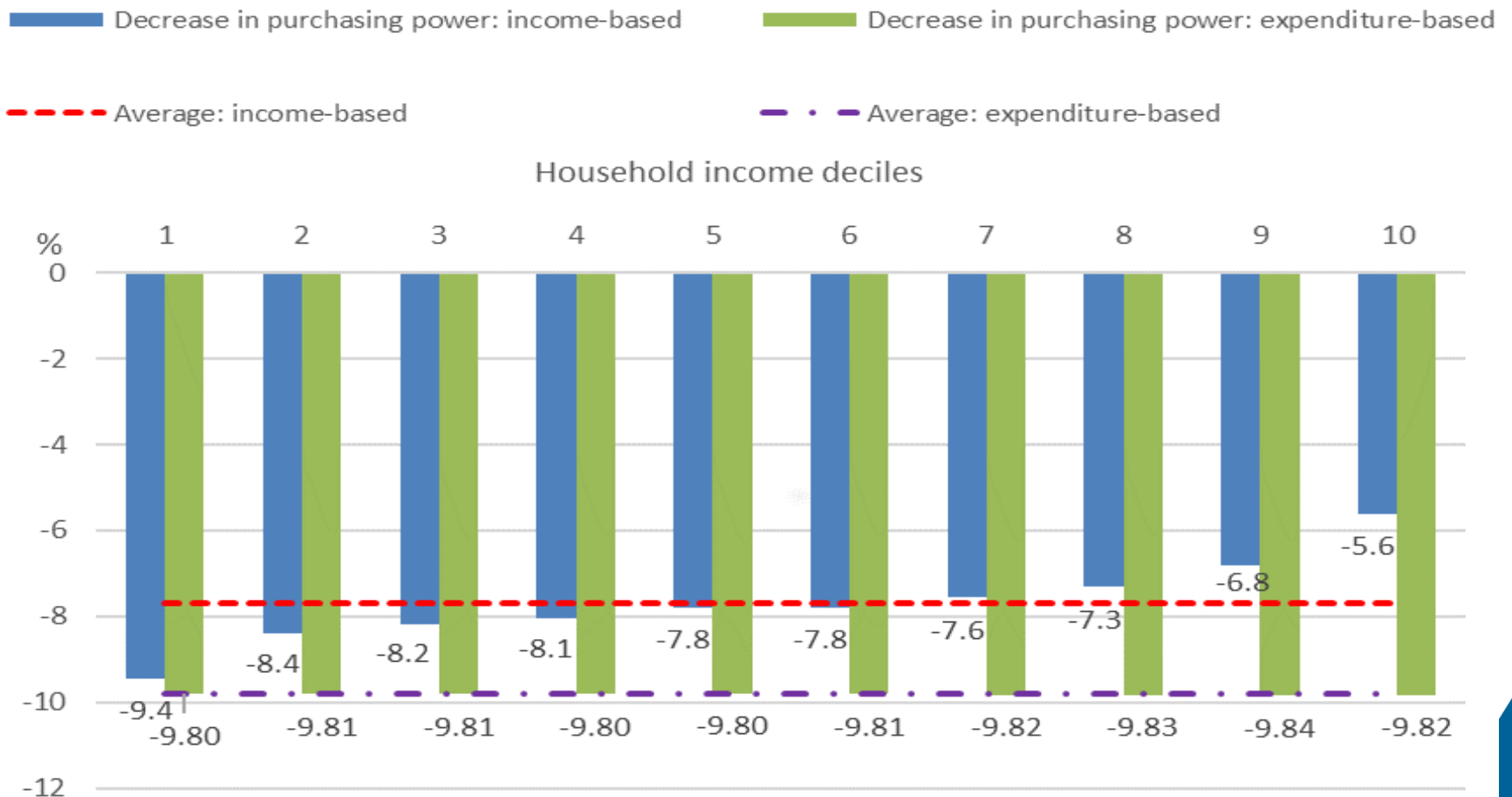
Income Approach





Purchasing power change by income quintiles: France – two approaches

A 25% tariff imposed on all imports except oil and gas from non-EU sources





Limitations, Caveats, & remaining issues

Limitations and caveats of mapping exercise

- Assumptions may introduce bias
- Quality of goods is not taken into account

Remaining issue

- Converting relative prices from models to absolute price changes for household budgets



Thank you.