EUROPEAN COMMISSION
European Research Area

SEVENTH FRAMEWORK
PROGRAMME

Environment Center
Charles University
in Prague

GLOBAL-IQ WP2
Non-market impacts and behavioural analysis of key sectors

Wednesday Workshop

Charles University Prague, 10 October 2012

WP2

Tasks

- Valuation of non-market effects *(4 tasks)*
  - due to climate change and related to ancillary effect
  - large scale health effects under population dynamics
- Adoption of saving installations in households *(2 tasks)*
  - impact of climate change related variables on household behaviour
  - installation of renewable micro-generation technologies
- Energy demand estimation *(2 tasks)*
  - demand of households and production function of sectors
  - empirical model that will deal with optimal second best taxation of both
- Trade Policy and Climate Policy *(3 tasks)*
  - existing empirical evidence and new theory on competitiveness effects
  - the performances of different policy tools in the long run

Partners

CUNI Charles University in Prague, Environment Center (CZ)

HEID Graduate Institute of International Studies in Geneva (CH)

ISIS Istituto di Studi per l'Integrazione dei Sistemi (ITA)

TSE Toulouse School of Economics (FR)

Wednesday agenda

14:30-14:45 **Welcome by JPA and EC Officer (for all)**

14:45-15:30 **Valuation of ancillary effect and externalities, Tasks 2.1.2 & 2.1.3**

- Jan Melichar, CUNI: in developed countries (10min)
- Chiara Ravetti, HEID: in developing countries (10min)
- Carlo Sessa, ISIS: transport externalities and the GRACE model (10min)
- Discussion on the links (15min)

15:30-16:05 **Tax incidence (35min), Task 2.3.1**

- Ladoux Norbert, TSE: Cremer's model (15min)
- Milan Ščasný, CUNI: DASMOD microsim model (10min)
- Discussion (10min)

16:05-17:20 **Health benefit valuations (60min), Tasks 2.1.1 & 2.1.3**

- Vojtěch Máca, CUNI: review of health impacts (10min)
- Chiara Ravetti, HEID: China survey (15min)

  Coffee break 16:30-16:45
- Jean-Pierre Amigues, TSE: Population dynamics: age, epidemic, popul in IAMs (15min)
- Discussion (20min)

17:20-18:00 **Trade Policy and Climate Change (40min), Tasks 2.4**

- Chiara Ravetti, HEID: Where we are in Task 2.4.1 & 2.4.2 (10min)
- Jean-Pierre Amigues, TSE: Task 2.4.3. (15min)
- Discussion (15min)

DASMOD model

Name: **D**istributional **A**nd **S**ocial Impact **MOD**el

Purpose: to simulate distributional effect of energy taxation on households (for the Czech Republic).

Type: **Micro-simulation model**

- household-level data (Czech Family Budget Surveys; N=3,000)
- full description of incomes and expenditures (similar, but rich than *Euromod tax-benefit simulation model*)
- simulation performed at the most disaggregated level, then grouped for several household segments
- responsiveness of households → demand parameters estimated via AID system
- partial-equilibrium, no GE effects (no feedbacks, no indirect effect), only the first-round effect (except effect on price of heat)

DASMOD model /2

Type: Micro-simulation **optimisation static** model

- for specific energy taxing policy, search for new parameters of labor taxation in order to keep
  - *revenue neutrality*, i.e. get public revenues unchanged
  - *household welfare neutrality*, i.e. total welfare of households is unchanged
  - *household budget neutrality*, i.e. total incomes are unchanged
- no dynamic character, i.e. provides the before-tax and the after-tax volumes
- linked to analysis of inequalities measured by inequality indexes
  - income inequality (Gini, Theil) or tax progressivity (Suits, Kakwani)

DASMOD model /3

Micro-simulation optimisation **static** model

- ***consumption-energy module***
  - effect on energy consumption and expenditures
  - effect on expenditures on other goods
  - effect on welfare (CV approximated by the CLIs)

- ***labour-benefit module***
  - labour tax (PIT, deductibles, SSC) paid before and after change (labour supply is fixed!)
  - social transfer to mitigate adverse social effect

- ***fiscal module***
  - paid taxes and effect on public revenues
  - dead/-weight loss (a difference between hypothetical compensation to keep household welfare unchanged and change in public revenues)

- ***environmental module***
  - effect on damage, i.e. environmental external costs

DASMOD model /4

Model extensions and updates

- Re-estimate household demand system
- Update parameters of labour taxation
- More accurate estimation of welfare effect
- Improve assessment of environmental effect

ETR (2003/96/EC) Simulations

(Czech Republic; in CZK per household)

	Households						Public finances		
	expenses	eco taxes	taxes	transfer	CV (CLI)	Welfare	revenues	DWL	revenues
deciles									
1	103	495	0	0	563	-563	479	84	479
2	124	495	0	0	560	-560	475	85	475
3	154	453	0	0	505	-505	429	77	429
4	77	513	0	0	588	-588	501	88	501
5	105	477	0	0	543	-543	460	83	460
6	145	465	0	0	520	-520	442	79	442
7	83	503	0	0	579	-579	489	90	489
8	112	513	0	0	586	-586	495	90	495
9	96	498	0	0	568	-568	482	86	482
10	117	488	0	0	554	-554	469	85	469
ener groups									
ELEKTRINA	114	216	0	0	235	-235	198	37	198
ELEcookGAS	-381	279	0	0	412	-412	340	72	340
HEATcookELE	-285	258	0	0	310	-310	304	7	304
BLOCKofFLATS	480	392	0	0	386	-386	315	70	315
GASheat	-306	630	0	0	811	-811	679	132	679
COALheat	911	921	0	0	893	-893	776	118	776

ETR Simulations: Welfare effect

(Czech Republic; EV in CZK per household)

	w/o RR	lowest PIT cuts 12% - 11.5%	SSC cuts 12.5% - 12.2%	increase in tax credits 7,200Kč - 7,720Kč
deciles				
1	-563	133	-86	94
2	-560	52	-83	6
3	-505	-64	-111	-81
4	-588	-235	-251	-247
5	-543	-146	-160	-144
6	-520	-76	-90	-71
7	-579	46	44	81
8	-586	151	178	183
9	-568	247	330	273
10	-554	239	569	251

ETR-CZE Simulations

Welfare effect in CZK per household

	w/o RR	cuts 12% - 11.5%	SSC cuts 12.5% - 12.2%	tax credits 7,200Kč - 7,720Kč
ener groups				
ELEKTRINA	-235	380	332	374
ELEcookGAS	-412	-112	-168	-68
HEATcookELE	-310	220	235	217
BLOCKofFLATS	-386	186	215	189
GASheat	-811	-199	-208	-197
COALheat	-893	-234	-297	-247
social status				
farmer_rural	-710	102	67	122
farmer_urban	-669	158	131	136
retired_5000-	-788	-788	-775	-788
retired_5000+	-475	-475	-463	-475
retired_20000+	-394	-394	-381	-394
EA1_small	-565	-95	-181	-39
EA1_large	-546	97	76	94
EA1+_small	-651	16	-149	-113
EA1+_large	-543	118	34	15
EA2_small	-811	163	209	238
EA2_large	-586	394	513	452
EA2+_small	-816	232	198	285
EA2+_large	-633	456	476	491

Incidence Measurement

Own price elasticity estims (CZ)

	electricity	gas	heat	solid fuels
Household group classified according to the heat source (AIDS)				
ELECTRA	-0.52			
ELEcookGAS	-1.04	-2.26		
HEATcookELE	-0.25		-1.22	
HEATblocks	-0.32	-0.95	-0.84	
GASheat	-0.23	-0.94		
COALheat	-0.47			-0.11
*Average elasticity***	*-0.324*	*-0.978*	*-0.938*	*-0.11*
Groups classified according to the social status and the size of municipality (AIDS)				
Weighted mean	-0.63	-0.47	*	-0.03
Min among the groups	-0.45	-0.21	*	-0.03
Household of farmers	-0.53	-0.42	*	*
Households of pensioners	-0.73	-0.51	*	*
Max among the groups	-0.84	-0.56	*	-0.03
Income deciles (TS)				
Average- weighted	-0.30	-0.55	-0.48	n.a.