

The impact of multilateral liberalisation on European regions: a CGE assessment

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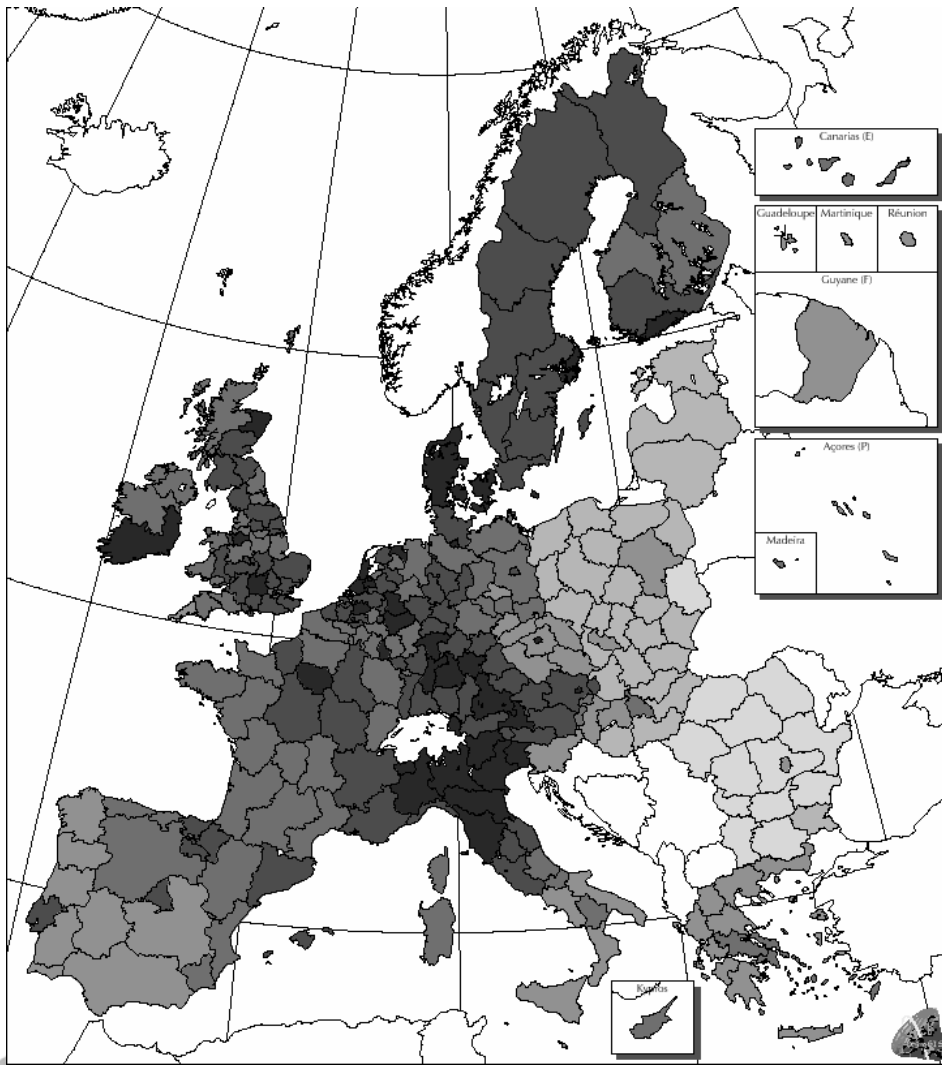
Overview

- Motivation
- State of the Art
- The DREAM model
- The Database
- Applications to multilateral liberalisation
- Conclusion

Motivation

- Gains are not evenly distributed geographically
- Trade Policy and Cohesion Policy: Commission competence
- Improving assesement of Trade Liberalization

The NUTS-1 European Union



- EU15 = 78 regions

- Income per capita : from 1 to 7

- EU25 = 119 regions

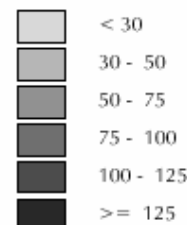
- Income per capita : from 1 to 20

- Disparities in :

- Income and Wealth
- Factor endowments
- Specialization

Map 1: GDP per head by region (PPS), 2000

Index, EU-25 = 100



MT: 1999

Source: Eurostat

State of the Art

- New Geographical Economics :
 - Space matters
 - "home bias" exists even across regions within a given country (see e.g. Combes et al., 2003)
- Three models for dealing with regional economic issues (West,1995):
 - Input-Output (IO)
 - Integrated IO and econometric models (IOE)
 - Computable general equilibrium (CGE) models



CGE Modelling at regional level

- CGE are demanding in terms of data, parameter values and computational resources
- 3 different approaches:
 - top-down ORANI model (Dixon et al. 1982), MONASH model (Adams et al., 1994)
 - hybrid
 - bottom-up full-fledged regional, CGE model (see Partridge and Rickman, 1998, for a survey of this class of models)
- The Australian expertise: Johansen-ORANI type model (8 regions and 13 sectors)



Building our DREAM (Deep Regional Economic Analysis Model)

- A full-fledged, European interregional CGE model
- An original two-tier approach where a regional general equilibrium model (DREAM) is tied to an EU-wide, trade policy general equilibrium model (MIRAGE).

MIRAGE Assumptions

- Multi-country, Multi-sector CGE model
- Oligopolistic Competition
- Nested-Armington Demand structure
- Based on GTAP and MacMap (CEPII-ITC) database
- Trade policy shock → changes in EU's import prices, in EU's export demand curves → DREAM model.

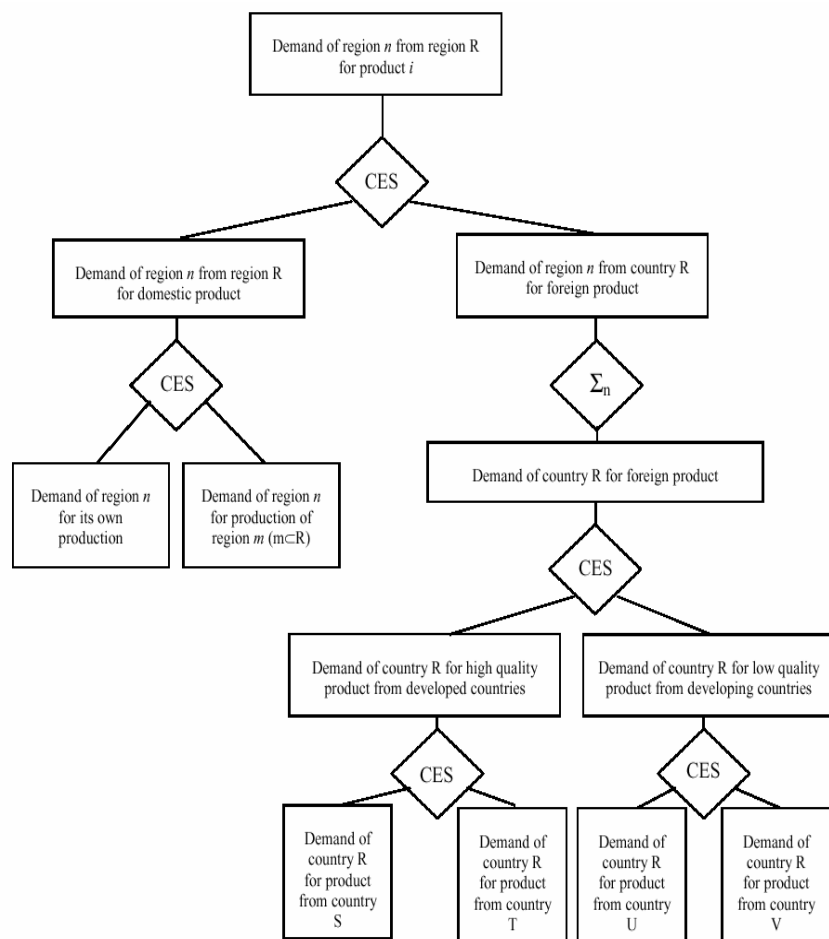


DREAM Simplifications

- DREAM mimics MIRAGE's theoretical structure BUT:
 - Perfect competition for every sectors
 - Country mix of imports (geographical distribution across providers, including foreign EU regions) and Country mix of exports (geographical distribution across markets, including foreign EU regions) is assumed to be constant across regions, within each EU country. (without this assumption : $119 \times 119 = 14,161$ flows for each sector.)
 - Leontieff fonction for intermediate consumptions

DREAM specificities

Figure1: The Demand side



- Labour mobility accross regions of the same country (Migrations)
- Perfect capital mobility at the EU scale
- Cross-regional redistribution through national and European budget.

Building an exhaustive and coherent database

- GTAP 5.3 as national sources
- EUROSTAT's REGIO (data at NUTS1 level but high missing rate, to 30%!)
- EUROSTAT's NeoChronos for some data about industrial sectors
- « European Commission Budget » for transfers and European Budget.
- National sources

The results: 119 regions – 21 sectors

- Base year 1997
- Mapping European NACE classification to GTAP
 - 3 agricultural sectors
 - 2 other primary activities
 - 9 industrial sectors
 - 7 services

Some gaps to fill...

- Cross regional, intra-national trade flows: calibration procedure using Minimisation Entropy Criteria and taking into account home bias effects.
- Missing foreign trade by regions: the main limitation
- Factors market: some calibrations exercises
- Capital ownership distributed across regions by following the no-labour income distribution in the household accounts

Experimental design:

18 sectors - 6 No-EU areas - 119 NUTS1 regions.

- a) Tariff peak removal: all tariffs, defined at the HS-6 level, exceeding an ad-valorem equivalent of 15% are cut back to 15% [at HS6 level on Bounded tariffs thanks to the MacMap database and the CEPII's CTS database]
- b) Complete liberalisation: all tariffs, domestic support measures and export subsidies are cut by 50%.
- c) Agricultural tariff liberalisation: tariffs are removed in agricultural and food products.
- d) Ag. tariff+DS+XS: tariffs, domestic support measures and export subsidies are removed for agricultural and food products.
- e) Manufacturing (except textile-wearing): tariffs are removed for non-agricultural products, except textile-wearing-leather and shoes.
- f) Textile-wearing liberalisation: tariffs are removed for the textile, wearing, leather and shoes sectors.



Protection Data

Initial levels (%)

EU's protection

i	ACP	Cairns	DvgAsia	Japan	Row	USA	Av. Tariff
Agri_Ind	24.95	28.39	12.73	17.50	10.71	28.27	20.43
Animals	0.61	23.45	12.36	3.01	16.57	8.19	10.70
Cereals	0.96	9.13	2.32	8.23	7.81	3.86	5.38
Chim_Ind	0.00	2.43	1.40	3.91	1.41	3.44	2.10
Extraction	0.00	0.02	0.03	0.18	0.00	0.05	0.05
Fishing	0.10	7.36	5.84	7.37	3.63	8.62	5.49
Mach_Ind	0.00	0.92	0.82	1.86	0.58	1.05	0.87
Metal_Ind	0.01	1.60	2.57	1.98	1.06	2.28	1.58
OthInd	0.00	1.16	1.70	1.79	0.58	1.39	1.10
OthVeg	1.26	5.78	2.78	5.66	5.16	5.03	4.28
Paper_Ind	0.00	0.05	0.02	0.30	0.03	0.19	0.10
Tex_Ind	0.00	7.72	8.69	6.84	3.63	6.87	5.62
Tran_Ind	0.00	7.10	2.05	7.90	3.21	4.06	4.05
Wood_Ind	0.00	1.19	0.39	1.88	0.19	1.44	0.85
Av. Tariff	1.99	6.88	3.84	4.89	3.90	5.34	4.47

Post Tariff Peaks Cut Level(%)

EU's protection

i	ACP	Cairns	DvgAsia	Japan	Row	USA	Av. Tariff
Agri_Ind	3.13	9.52	7.69	10.57	6.00	11.08	8.00
Animals	0.44	7.06	4.64	2.66	4.88	2.82	3.75
Cereals	0.51	6.33	2.04	4.56	7.60	3.59	4.11
Chim_Ind	0.00	2.53	1.42	4.08	1.46	3.62	2.19
Extraction	0.00	0.02	0.03	0.18	0.00	0.05	0.05
Fishing	0.10	7.36	5.84	7.37	3.63	8.62	5.49
Mach_Ind	0.00	0.92	0.82	1.86	0.58	1.05	0.87
Metal_Ind	0.01	2.21	2.83	5.13	2.03	3.22	2.57
OthInd	0.00	1.23	1.97	2.09	0.63	1.48	1.23
OthVeg	1.13	4.40	2.28	5.20	4.50	4.76	3.71
Paper_Ind	0.00	0.67	0.17	1.55	0.35	1.00	0.62
Tex_Ind	0.00	7.76	8.69	7.29	3.73	7.23	5.78
Tran_Ind	0.00	7.05	2.05	7.85	3.21	4.02	4.03
Wood_Ind	0.00	1.19	0.39	1.88	0.19	1.44	0.85
Av. Tariff	0.38	4.16	2.92	4.45	2.77	3.86	3.09

Protection faced by EU

i	ACP	Cairns	DvgAsia	Japan	Row	USA	Av. Tariff
Agri_Ind	27.46	27.36	14.50	31.97	30.45	5.51	22.88
Animals	9.17	5.87	4.12	51.58	25.59	0.77	16.18
Cereals	6.99	8.32	17.34	151.16	54.89	1.99	40.12
Chim_Ind	10.71	5.66	7.75	1.85	4.82	2.26	5.51
Extraction	7.67	1.79	3.04	0.96	2.27	0.08	2.64
Fishing	19.13	2.16	1.39	4.68	12.46	0.46	6.71
Mach_Ind	8.36	4.23	5.64	0.12	4.58	1.19	4.02
Metal_Ind	13.84	5.67	7.10	0.97	5.03	1.94	5.76
OthInd	29.79	6.16	9.64	1.84	5.00	2.36	9.13
OthVeg	15.39	3.66	12.12	5.26	21.92	3.41	10.30
Paper_Ind	10.92	4.02	7.03	0.02	3.65	0.08	4.29
Tex_Ind	17.85	14.26	8.25	8.88	10.05	9.07	11.39
Tran_Ind	11.47	9.39	7.99	0.00	8.49	2.35	6.61
Wood_Ind	22.34	6.53	3.28	1.61	5.30	0.72	6.63
Av. Tariff	15.08	7.51	7.80	18.64	13.89	2.30	10.87

Protection faced by EU

i	ACP	Cairns	DvgAsia	Japan	Row	USA	Av. Tariff
Agri_Ind	12.59	7.41	7.94	11.38	9.29	4.95	8.93
Animals	7.72	2.28	3.69	10.52	6.61	0.77	5.27
Cereals	4.83	5.09	3.59	10.79	7.57	1.99	5.64
Chim_Ind	7.44	4.90	5.82	1.88	4.42	2.49	4.49
Extraction	6.45	1.35	2.27	0.96	2.12	0.08	2.21
Fishing	11.82	1.11	1.48	4.68	7.33	0.46	4.48
Mach_Ind	6.86	4.09	5.95	0.12	4.23	1.19	3.74
Metal_Ind	9.10	5.12	5.14	1.26	4.64	2.39	4.61
OthInd	13.13	5.51	5.90	1.92	4.24	2.36	5.51
OthVeg	8.68	2.89	6.18	4.91	7.53	2.64	5.47
Paper_Ind	7.64	3.90	5.89	0.42	3.96	0.53	3.72
Tex_Ind	10.38	11.46	10.35	8.99	6.75	8.93	9.48
Tran_Ind	9.31	5.57	5.21	0.00	4.87	1.97	4.49
Wood_Ind	12.20	5.85	3.89	1.61	4.55	0.74	4.81
Av. Tariff	9.15	4.75	5.24	4.25	5.58	2.25	5.20

Complete Liberalisation - Overview

Region	Agri		Manuf.		Tex_Wea		Real GDP		Eq var	Adj_Ind	Capital Flows
	Initial	Sh. %	Initial	Sh. %	Initial	Sh. %	Initial	%			
Eire	9.0	-21.4	29.3	2.9	0.8	-9.1	67 230	-0.2	0.9	5.0	-3.4
France	6.1	-5.8	18.7	0.9	0.9	-5.8	1 369 000	0.2	0.2	1.7	-0.2
Ile de France	1.5	-4.5	12.2	0.8	0.4	-5.7	359 200	0.4	0.6	1.0	0.5
Ouest - France	13.6	-6.7	18.8	1.0	1.2	-5.9	160 800	-0.4	-0.5	2.5	-1.7
Greece	18.9	-2.9	15.0	0.1	2.9	-3.8	115 300	-0.1	0.2	2.5	-1.8
Kentriki Ellada	26.3	-3.3	14.3	0.4	1.6	-4.1	23 550	-0.4	-0.3	2.8	-3.4
Attiki	8.0	-2.7	18.2	0.2	2.1	-3.6	46 050	0.2	1.0	2.0	-0.1
Nisia Aigaiou	39.7	-1.5	5.9	-0.4	1.2	-3.9	12 690	-0.2	-0.1	2.4	-2.3
Noord-Nederlan	9.0	-2.5	16.2	0.2	0.3	-6.2	34 920	0.7	0.2	1.6	0.8
Estonia	13.5	-1.0	18.2	8.8	3.7	-16.1	3 895	2.3	0.6	14.7	4.0
Slovakia	13.1	-4.3	25.2	0.4	4.9	-7.2	17 360	0.0	0.2	4.2	-1.1
Bratislava	7.5	-2.8	21.6	0.5	4.2	-7.1	4 051	0.4	0.7	2.9	0.3
Zapadne Zlo.	17.4	-4.9	27.8	0.3	5.4	-7.4	5 600	-0.4	0.1	5.0	-2.4
Stredne Zlo.	13.6	-4.2	26.8	0.4	5.2	-7.2	3 863	0.0	0.1	4.2	-1.1
Vychodne Zlo.	12.1	-4.3	23.6	0.3	4.6	-7.3	3 847	0.0	0.1	4.1	-0.9
20-richest	4.1	-3.9	17.9	0.8	0.8	-7.7	3 031 000	0.3	0.2	1.5	0.4
40-poorest	13.1	-0.8	20.1	1.2	3.1	-9.2	257 300	0.5	0.2	3.9	0.4
AccCount	12.4	-0.8	19.5	1.3	3.0	-9.2	274 700	0.6	0.2	3.7	0.4
EU15	5.6	-5.6	18.3	0.9	1.3	-6.3	7 981 000	0.2	0.2	2.0	0.0
EU25	5.8	-5.2	18.3	0.9	1.4	-6.5	8 255 000	0.2	0.2	2.1	0.0

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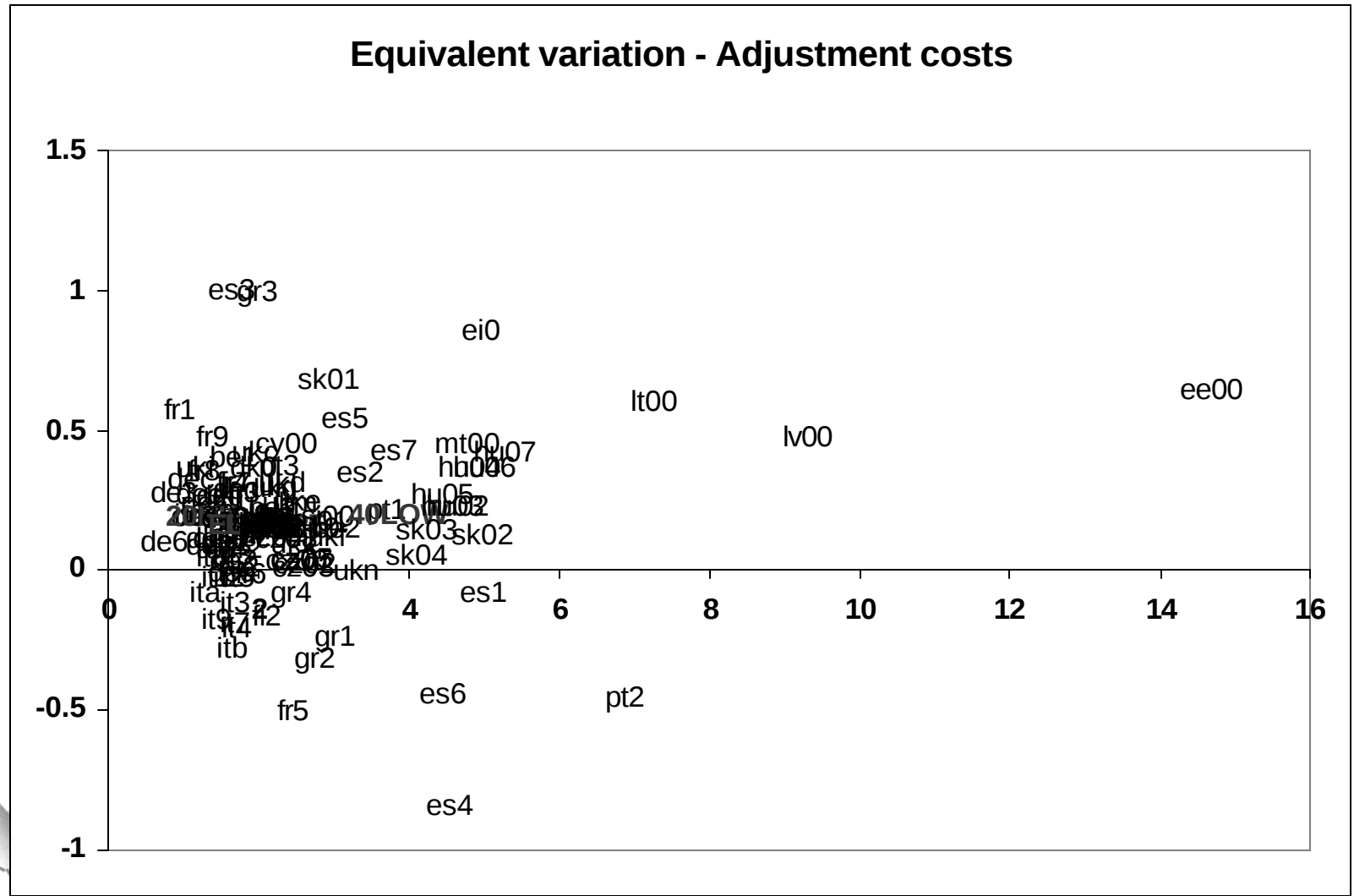
Complete Liberalisation – Top 5

	Exports (rises)			Imports (rises)			Production (rises)			Production (falls)		
	Region	Vol.	%	Region	Vol.	%	Region	Vol.	%	Region	Vol.	%
Agri_Ind	dk0	822	22.2	dk0	1286	96.0	ee00	62	7.2	ei0	-2640	-19.6
	nl3	632	27.4	pt1	815	114.2	lt00	47	2.8	be2	-1860	-8.7
	nl4	467	27.7	se0	632	95.9	si00	40	1.1	es5	-1530	-8.3
	fr5	394	17.7	be2	568	114.7	pl07	15	0.4	fr5	-1390	-4.6
	nl2	382	27.5	ei0	537	158.8	pl0c	15	0.4	dk0	-1230	-5.3
Tex_Ind	es5	223	13.6	se0	492	30.6	fi2	0	-8.7	dea	-1160	-8.3
	it5	180	4.5	dk0	415	30.9	pt2	-1	-9.0	pt1	-1100	-8.0
	it2	164	4.2	pt1	262	39.1	es7	-1	-4.7	de2	-1080	-8.4
	it3	129	4.2	be2	225	22.5	fr9	-3	-5.4	de1	-1020	-8.5
	fr7	111	10.1	fi1	197	37.4	de6	-8	-8.1	it2	-1010	-4.7
Mach_Ind	se0	1144	7.2	ei0	340	3.8	se0	925	2.4	nl3	-48	-0.3
	de1	981	5.1	se0	198	3.5	ei0	879	4.1	ee00	-23	-4.9
	dea	869	5.2	fi1	144	4.3	fi1	780	3.6	nl1	-6	-0.1
	de2	828	5.3	dk0	70	2.8	dea	621	0.9	nl4	-4	0.0
	fi1	650	10.1	be2	30	1.8	de1	621	0.7	nl2	-1	0.0
TransCom	fr1	139	2.7	lt00	3	1.6	nl3	1348	3.6	pt2	4	1.2
	nl3	127	2.6	ee00	2	1.7	dk0	772	2.8	fi2	5	1.2
	es5	97	3.9	lv00	1	0.6	be2	695	3.8	hu04	5	0.9
	uki	86	2.9	fi2	0	-1.8	fr1	665	1.2	hu07	6	0.9
	dk0	76	2.8	pt2	0	-4.0	se0	642	2.1	hu02	7	1.3

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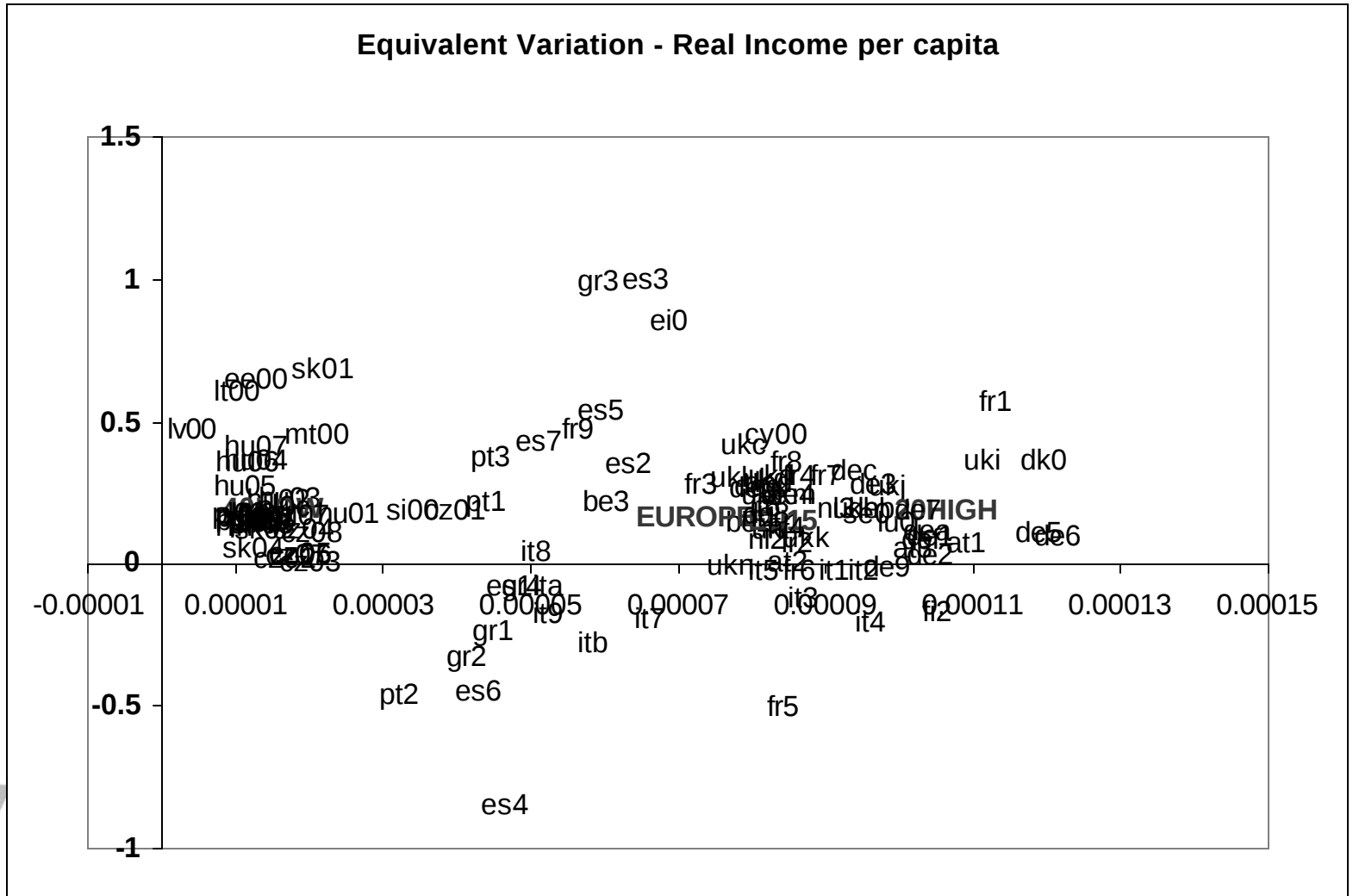
Complete Liberalisation



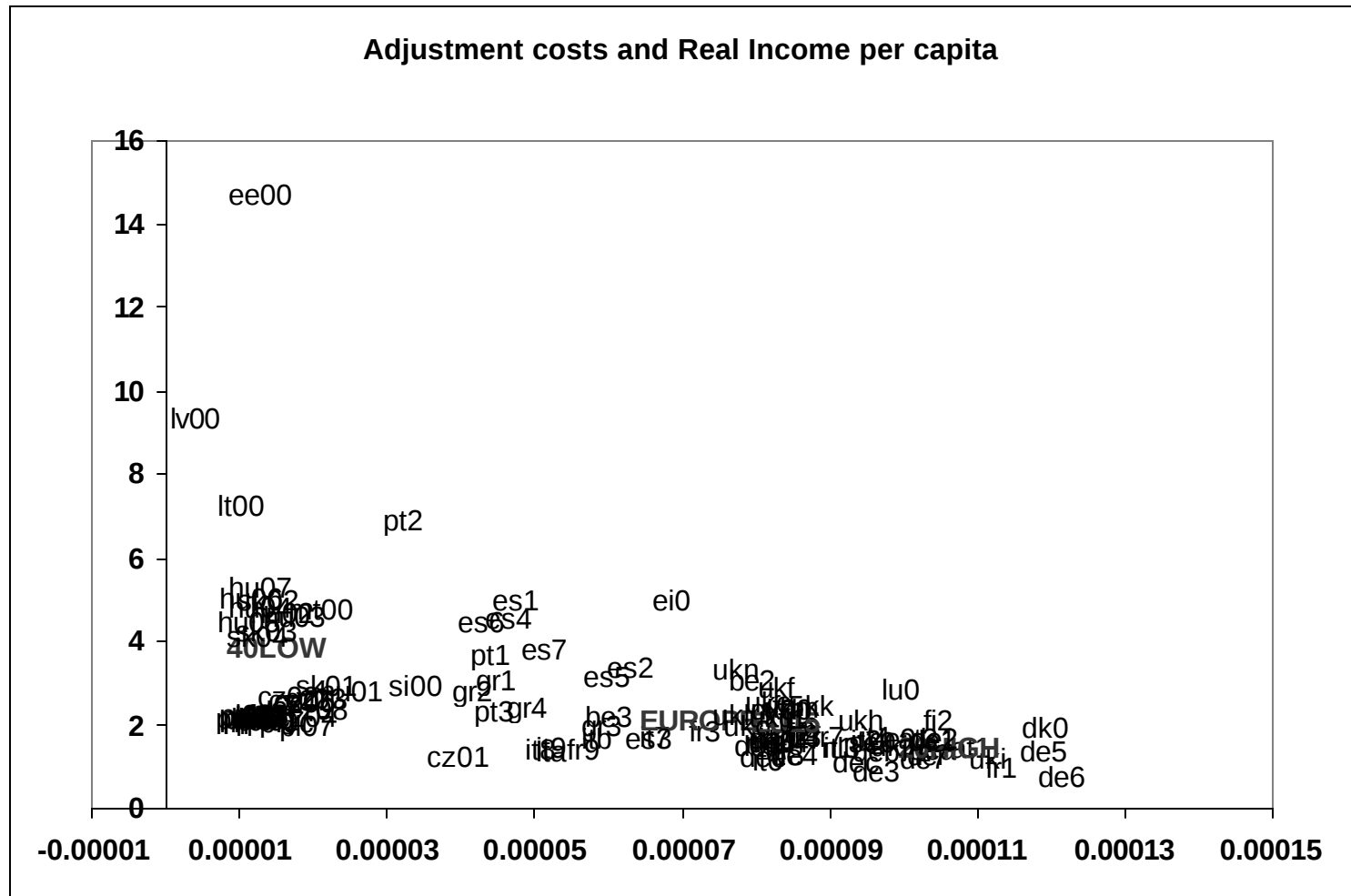
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Complete Liberalisation



Complete Liberalisation



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A few comments about other scenarii (Manufacturing sectors)

- 0 for 0 on textiles and wearing:
 - –10% of VA in Portugal and in some German regions (Nordrhein-Westfalen, Bayern, Baden-Wurtttemberg)
 - –6%, but more than \$ -1 billion in Lombardia and Centre of Italy. Italy and Portugal are the two EU-15 countries where the real income impact is negative
- Liberalising trade in manufacturing outside textiles and wearing
 - strong offensive interests in the transport equipment sector in EU-15, and in particular in Germany (Baden-Wurtttemberg, Bayern and Niedersachsen).
 - Transport and communications are the other sector where the main output increases take place. Increased competition, but also general equilibrium effects when increased demand for exports induce a price increase, entails declines in several sectors and regions, notably in machinery, textiles-wearing and other services.

A few comments about other scenarii (Agricultural sectors)

■ Without reducing domestic support:

- ❑ Surge in extra-EU exports in regions such as Denmark, France West and Paris basin, the Netherlands (except East)
- ❑ No welfare gains

■ With cutting the agricultural subsidies:

- ❑ The main rural areas bear the bulk of the adjustment, namely Greece (except Athens' region), mainland Portugal, Ireland, France's West, Spain's Centre and South, Southern Italy (plus Emilia-Romagna).
- ❑ General equilibrium effects sharpen the difference between rural/urban regions.



Conclusions

- The main limitations so far are linked to data availability. In particular, the lack of harmonised regional data on external trade.
- A better understanding of asymmetric shocks and of rigidities consequences.