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Regional Social Accounting Matrices for the EU27 (SAMNUTS2)

Motivation

General: demand for model-based policy impact assessment of the Common Agricultural Policy (CAP) and general Rural Development policies in a multi-sector context is increasing to capture the effects on all branches of the regional economies and to allow a better regional scaling of policies.

Project context: the project “Common Agricultural Policy Regionalised Impact - The Rural Development Dimension” (CAPRI-RD)¹⁾ develops an integrated tool for policy assessment, combining the agro-economic CAPRI modeling system²⁾ with regional Computable General Equilibrium (CGE) models building on RegFin³⁾.

The SAMNUTS2 Project hosted at the European Commission’s Institute for Prospective Technological Studies (IPTS)⁴⁾ provides the database for the regional CGE models (see Figure 1).

Challenges

Structure:

- Consistency with CAPRI database for the agricultural sector
- Interregional trade flows, taxes, and institutions in line with regional CGE requirements
- The database distinguishes 19 economic branches (see Table 1) for 271 NUTS2 regions

Data:

- Regional employment data often only available for aggregate branches, data on regional consumption, taxes, and trade in general scarce
- Exploitation and combination of several, structurally and definitionally different data sources
- Compilation procedure has to permit inclusion of superior information whenever it becomes available

Used datasets

EuroStat (ESTAT): Regional branch accounts and national input-output tables

National Statistical Organizations (NSO): regional branch accounts obtained from NSO provided additional information compared to ESTAT. In general, an improvement of the database was achieved, but due to definitional differences, informational gains result in a rather mixed picture. The informational gain never reached a level above 0.92 (with 1.00 defined as full information, see Figure 2).

Compilation of prior database

- 1. Generation of national and regional core production accounts:** Include employment, compensation of employees, operating surplus, total output, total intermediate demand. Information on regional branch aggregates were split into target branches (Table 1) based on national shares (comparison of thus derived figures and recorded data for Spain and Italy shown in Figure 3). Additional employment data were collected for critical branches with regional concentration.
- 2. Generation of regional total transaction matrices:** Based on national input-output coefficients and core accounts (if no regional IOTs were available).
- 3. Generation of detailed transaction matrices:** Intermediate and final demand from regional origin based on Location Quotients (Flegg et al., 1995; Bonfiglio and Chelli, 2008). Domestic and imported origins derived from national shares.

Balancing/estimation procedure

Follows in general the prior compilation: balancing of national core production accounts, then regional core accounts, national transaction matrices, regional total transaction matrices, regional detailed transaction matrices (see Figure 4). Results from previous steps were used as constraints in subsequent steps.

Estimation: deviations between prior and final data were penalized by a Highest Posterior Density (HPD) criterion (Heckelei et al., 2008; Witzke and Britz, 2005), subject to accounting constraints. In a SAM context, the HPD estimator is similar to a Stone-Byron procedure (Byron 1978).

Implementation: the HPD estimator was implemented in GAMS as an NLP and solved with CONOPT. Data were stored throughout in.gdx containers. (Figure 4)

Further links

- 1) http://www.ilr.uni-bonn.de/agpo/rsrch/capri-rd/capri_rd_e.htm
- 2) www.capri-model.org
- 3) <http://www.helsinki.fi/ruralia/research/regfin.htm>
- 4) <http://ipts.jrc.ec.europa.eu/>

Marc Müller

Center for Development Research (ZEF)
Walter-Flex-Str. 3
53113 Bonn, Germany
Tel. +49 (0)228 731860
Mail: marc.mueller.zef@uni-bonn.de

Emanuele Ferrari

Institute for Prospective Technological Studies (IPTS)
Calle Inca Garcilaso, 3
41092 Seville, Spain
Tel. +34 954 48 8456
Mail: Emanuele.FERRARI@ec.europa.eu

Figure 1: Overview on the CAPRI-RD Tool

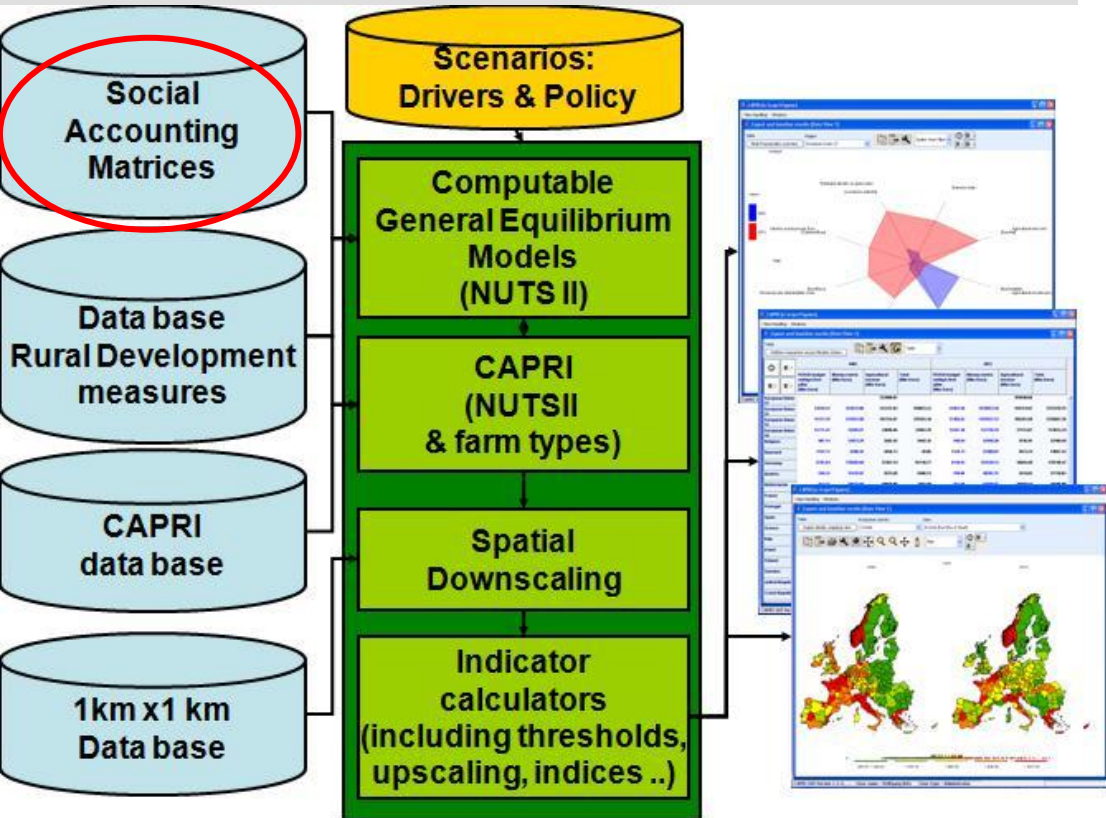


Table 1: Target Branches of the SAMNUTS2 Database

Block	Code	Description
Black	AA01	"Agriculture, hunting and related services"
	AA02	"Forestry, logging and related services"
	B000	"Fishing"
	C000	"Mining and quarrying"
	D000	"Food products, beverages, and tobacco"
	DF00	"Coke, refined petroleum products, and nuclear fuels"
	DZ00	"Other manufacturing"
	E000	"Electricity, gas and water supply"
	F000	"Construction"
	G000	"Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods"
Target sectors	H000	"Hotels and restaurants"
	I000	"Transport, storage and communication"
	J000	"Financial intermediation"
	K000	"Real estate, renting and business activities"
	L000	"Public administration and defence; compulsory social security"
	M000	"Education"
	N000	"Health and social work"
	O000	"Other community, social, personal service activities"
	P000	"Activities of households"

Figure 2: Branches in regional accounts and informational gain compared to ESTAT data – only Member States with more than one NUTS2 region

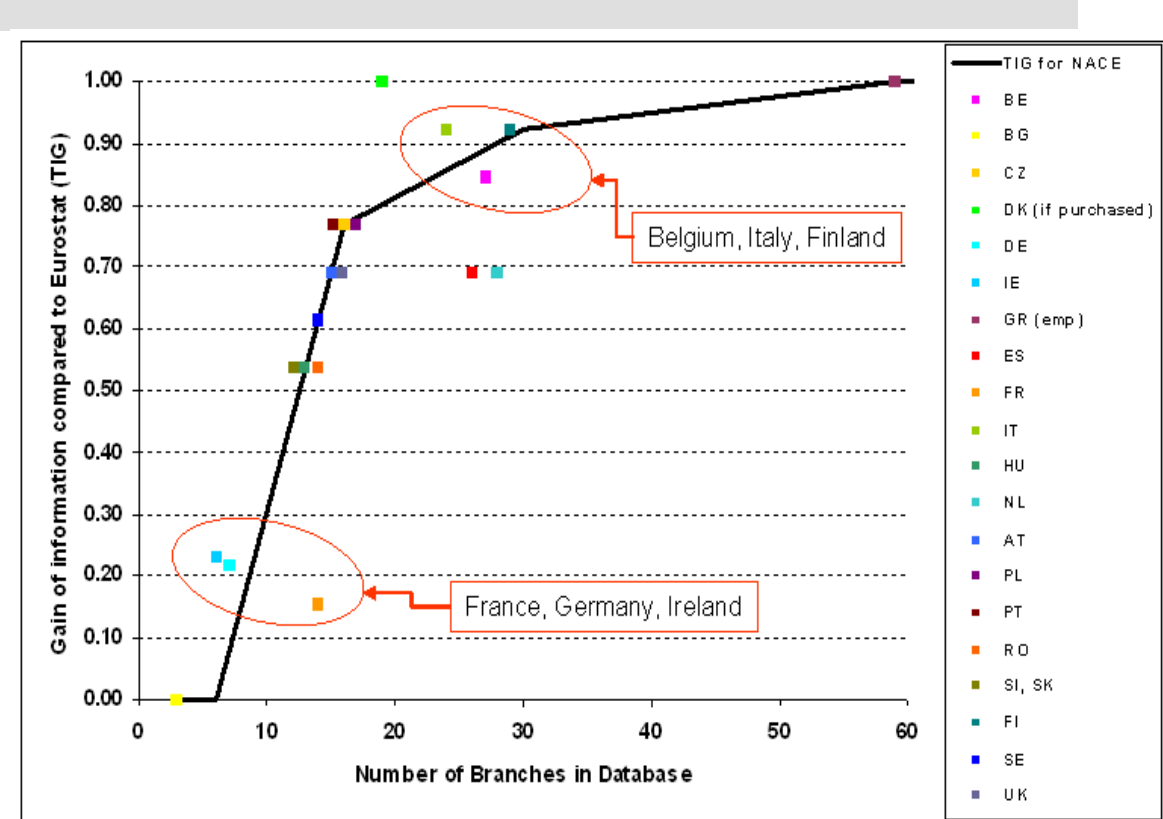


Figure 3: Deviation between National and Regional Shares in Spain and Italy

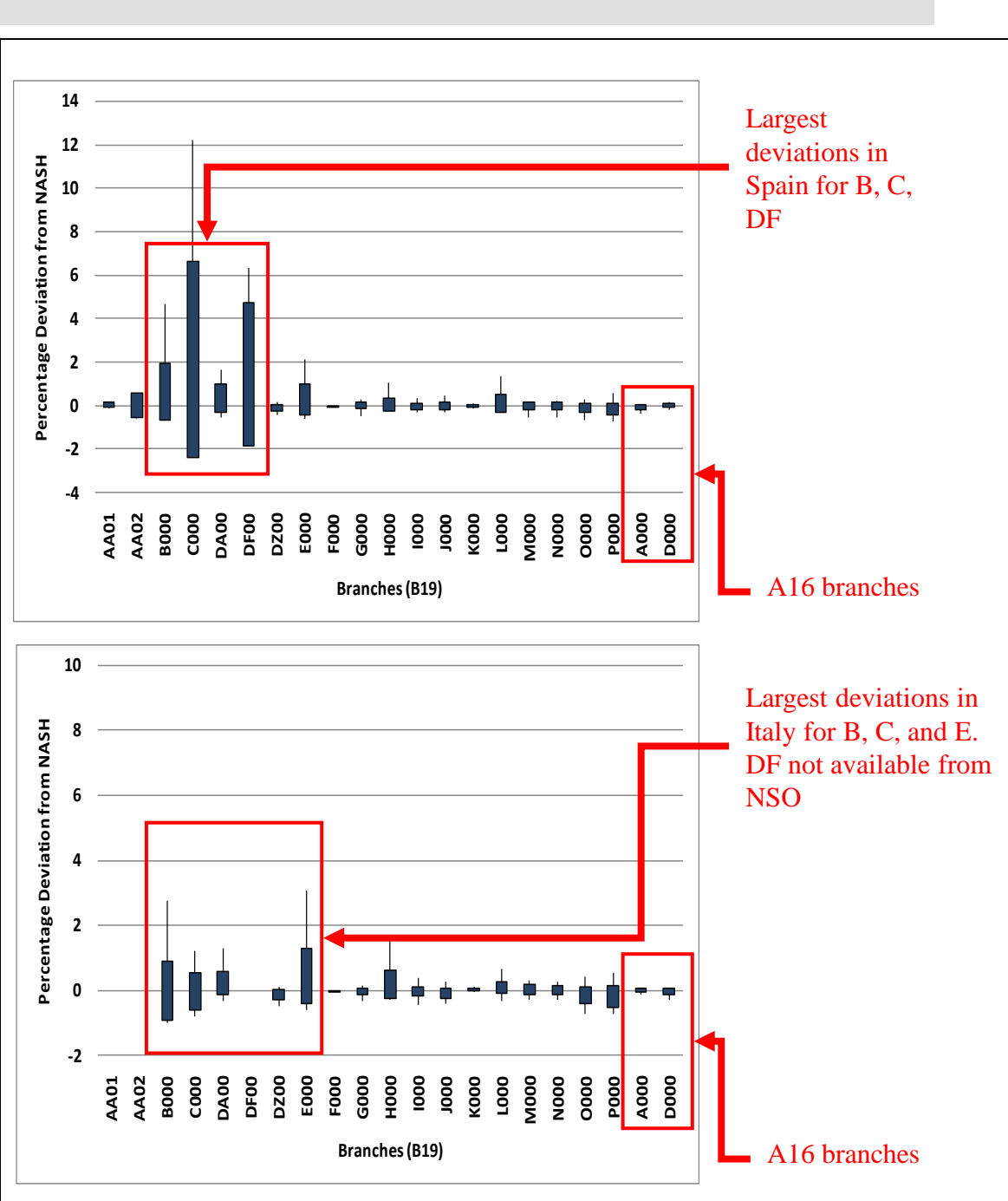


Figure 4: Flow of compilation steps in the SAMNUTS2 Procedure

