



FIGARO

Full International and Global Accounts for Research in Input-Output analysis

**The EU Inter-country Supply, Use
and Input-Output Tables**

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Outline

1. Background and objectives
2. Review of the methods
3. Methodology for the construction of EU IC-SUIOTs
4. Next steps

1. Background

- **Convergence** of the methods for the construction of ICIO tables **is called for** in order to support policy making in environment (footprints) and socio-economic applications (GVCs)
- Eurostat and DG JRC to develop **statistical standards** to be recognised by OECD (TiVA), UNSD and WTO on the basis of European Supply, Use and Input-Output tables compiled since 2012.
- Experimental **EU IC-SUIOTs** (2010), ESA2010, BPM6, NACE Rev.2, ISIC Rev.4, CPA/CPC (yearly for IOTs, 5-yearly for SUTs) – by summer 2017 – first version for 2010, later on 2010-2015

1. Objectives

The EU IC-SUIOTs aim to be the reference for analysis of trade, globalisation, socio-economic, national accounts and environmental EU policies

- Establish framework, infrastructure and capacity
 - **Based on National Accounts framework**
 - **Build up on available data from National Accounts dimension (national SUIOTs) and trade statistics**
 - **Annual Input-Output tables, five-yearly Supply, Use and IO Tables at 64 industries and products breakdown**
- Link to labour and capital productivity, environmental accounts and business statistics **extensions**
- Work organised in 11 Packages : two first hereafter

2. Review of the methods for global IO tables

- **EORA (University of Sydney, Australia):**
 - <http://worldmrio.com/>
- **EXIOBASE (TNO, Netherlands):**
 - <http://www.exiobase.eu/>
- **GTAP-MRIO (CICERO) [based on GTAP (Purdue University, US)]**
 - <https://www.gtap.agecon.purdue.edu/>
- **OECD/WTO:**
 - <http://www.oecd.org/trade/input-outputtables.htm>
- **WIOD (University of Groningen, Netherlands):**
 - http://www.wiod.org/new_site/home.htm

Dimensionalities

Table A.2 - Dimensionality

Dimension	EORA	EXIOBASE	GTAP-MRIO	IDE-JETRO	OECD-WTO	WIOD
Number of countries	187 countries; RoW as residual	43 countries; RoW	114 countries; 14 regions; RoW	10 countries; 4 exogenous regions (incl. RoW)	62 countries (CHN and MEX split); RoW	40 countries; RoW
Number of industries	26	163	57 (of which 20 agricultural)	76	34	35
Period	1990- 2011/2012	2000, 2007	Latest years: 2004 (base year), 2007	1975, 1985, 1995, 2000, and 2005	1995, 2000, 2005, 2008, 2009, 2010, and 2011	1995-2011

Source: Stehrer et al (2016)

Data sources

Table A.3 – Data sources

	EORA	EXIOBASE	GTAP-MRIO	IDE-JETRO	OECD-WTO	WIOD
Base data	IOTs, SUTs Different dimensions	SUTs; IOTs to estimate SUTs Further disaggregation	GTAP trade data Sector level determined by GTAP trade data	IOTs Aggregation to common level	SUTs; IOTs to estimate SUTs Adjusted to common classifications	SUTs Adjusted to common classifications
Harmonisation/ Benchmarking to SNA	SNA data as constraints in large-scale optimisation approach	SUTs benchmarked to SNA	Based on GTAP data (balanced beforehand)	IOTs benchmarked to SNA	SUTs benchmarked to SNA	SUTs benchmarked to SNA
Valuation (USEpp to USEbp)	Constructed during large-scale optimisation approach	Based on/estimated from existing information; or ‘similar country assumption’	Based on GTAP data providing information on international margins (and taxes)	Based on/estimated from existing information	Based on/estimated from existing information	Estimated using SUT-RAS procedure
Import use tables	Constructed during large-scale optimisation approach	Based on existing information or ‘similar country assumption’	Constructed using proportionality assumption	Based on existing information; in 2005 specific survey conducted	Mostly based on available information; else estimated using modified proportionality assumption	Constructed from imports in SUP using modified proportionality assumption

Source: Stehrer et al (2016)

Trade data

Table A.4 – Trade data: sources and adjustments

	EORA	EXIOBASE	GTAP-MRIO	IDE-JETRO	OECD-WTO	WIOD
Trade in goods	UN COMTRADE	UN COMTRADE	UN COMTRADE; balanced and consolidated	UN COMTRADE; national sources	OECD data based on UN COMTRADE; Modified UN BEC classification	UN COMTRADE; import data; Modified UN BEC classification
Trade in services	UN Services Trade Database	UN Services Trade Database	UN Services Trade Database, Eurostat, OECD adjusted	UN Services Trade Database; national sources	OECD-WTO TiS (based on Eurostat, UN, IMF); various imputation strategies	UN Services Trade Database, Eurostat, OECD adjusted; Modified proportionality assumption

Source: Stehrer et al (2016)

Re-exports and cif/fob margins

Table A.5 – Treatment of re-exports and CIF/FOB margins

	EORA	EXIOBASE	GTAP-MRIO	IDE-JETRO	OECD-WTO	WIOD
Re-exports			Already built-in in balanced trade data		Export column in import use tables; leave system	Defined as exports larger than domestic use; leave system
cif/fob adjustment		Difference between total value of imports and exports; GRAS procedure	Data already in fob	For 2005 specific survey undertaken	Bilateral cif/fob margins estimated with gravity	Bilateral cif/fob margins estimated with gravity
		Valuation matrix as difference between ImpUSEbcif and ImpUSEbfob			Adjustments in 3-step constrained quadratic mathematical programming procedure	RAS procedure when reconciling with SUTs export and import levels

Source: Stehrer et al (2016)

Construction of global multi-country SUIOTs

Table A.6 – Construction of MC-IOTs

	EORA	EXIOBASE	GTAP-MRIO	IDE-JETRO	OECD-WTO	WIOD
Construction of IOTs	Not necessary	Various	Not necessary	Not necessary	Model D	Model D

Source: Stehrer et al (2016)

More details of the methods at:

Economic Systems Research (Vol 26, 3, Sept 2014)
Arto et al (2014), Owen (2015) and Jones et al (2014)

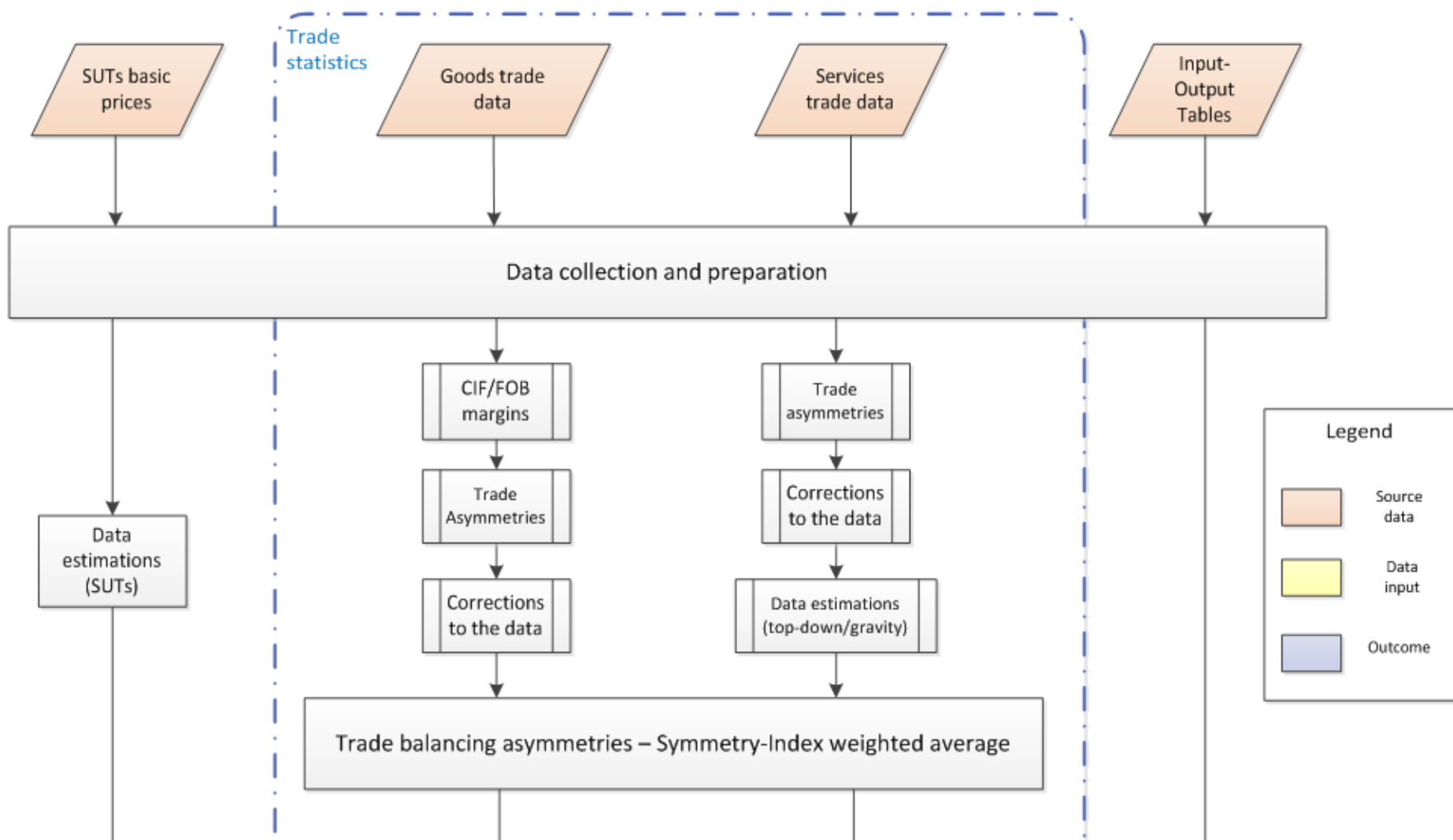
3. Methodological framework (FIGARO)

- Builds on Fortanier and Sarrazin (2016), Fortanier et al (2016) and Miao and Fortanier (2016) - OECD
 - ✓ **Transparency**
 - ✓ **Modularity**
 - ✓ **Collaboration and collective ownership**
 - ✓ **Long-term horizon**

[Concepts adapted to the EU version]

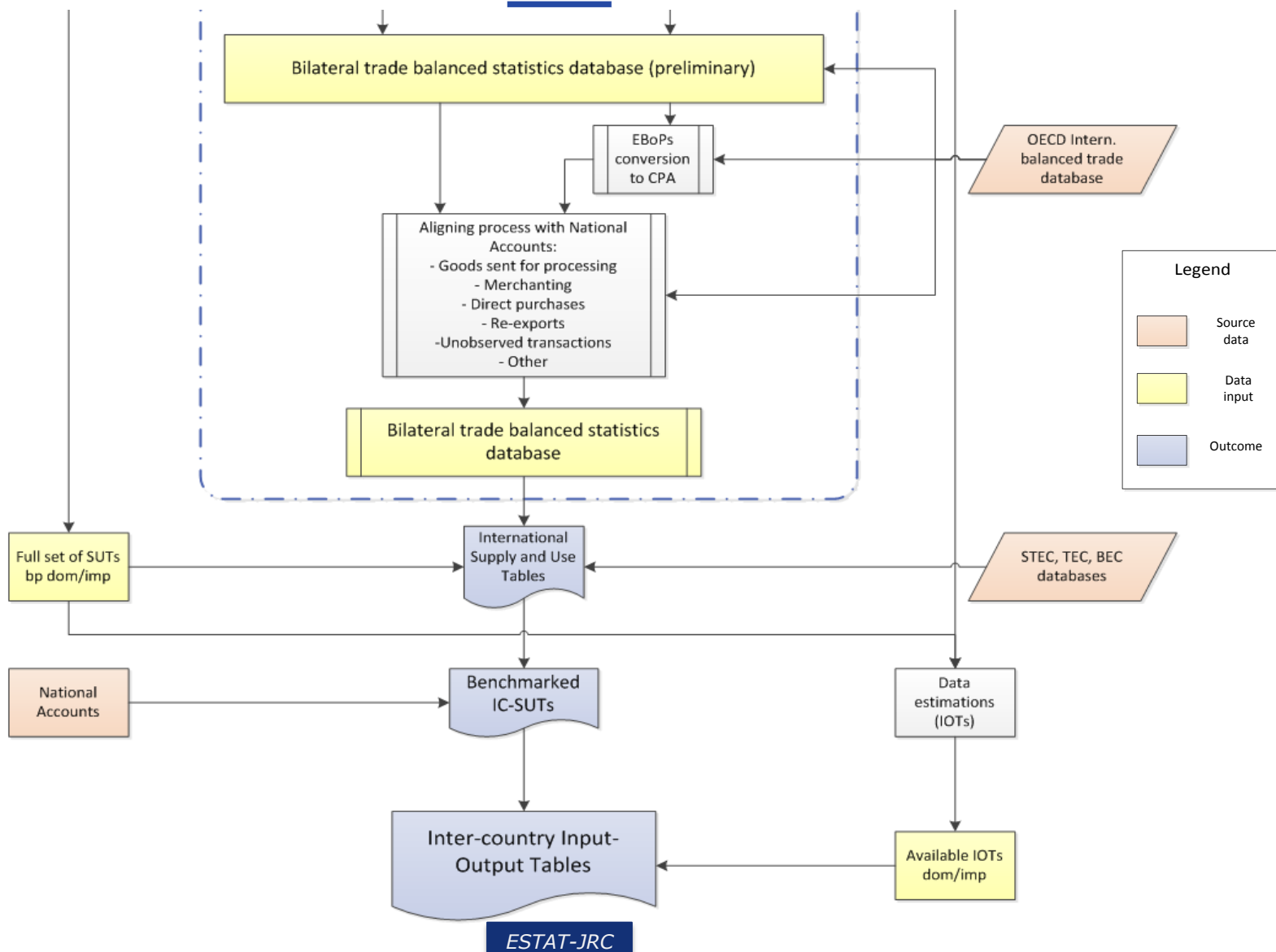


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SUTS	INDUSTRIES (NACE)	OUTPUT OF INDUSTRIES (NACE)																		FINAL USES				FINAL USES				FINAL USES					
		Country A						Country B						Country C						Country A		country B		Country C									
		Agriculture	Industry	Construction	Trade, hotel, transport	Finance, real estate, business	Other service activities	Total	Agriculture	Industry	Construction	Trade, hotel, transport	Finance, real estate, business	Other service activities	Total	Agriculture	Industry	Construction	Trade, hotel, transport	Finance, real estate, business	Other service activities	Total	Final consumption	Gross capital formation	Exports	Total	Final consumption	Gross capital formation	Exports	Total	Final consumption	Gross capital formation	Exports
A	Products of agriculture																																
	Products of industry																																
	Construction work																																
	Trade, hotel, transport services																																
	Financial, real estate, business serv. Other services																																
	Total																																
B	Products of agriculture																																
	Products of industry																																
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	Financial, real estate, business serv. Other services																																
	Total																																
C	Products of agriculture																																
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	Construction work																																
	Trade, hotel, transport services																																
	Financial, real estate, business serv. Other services																																
	Total																																
ports	Products of agriculture																																
	Products of industry																																
	Construction work																																
	Trade, hotel, transport services																																
	Financial, real estate, business serv. Other services																																
	Total																																
	CI/F/ FOB adjustments on exports																																
	Direct purchases abroad by residents																																
	Domestic purchases, by non-residents																																
	Total																																
		Compensation of employees																															
Other net taxes on production																																	
Consumption of fixed capital																																	
Operating surplus, net																																	
Value added, at basic prices																															</		

Blue = national SUTs
 Red = Trade statistics (only for country B, as example)
 Yellow = Totals and subtotals
 Grey = Set to zero

3. Methodological framework (1/5)

Preparing data inputs:

- **National SUTs (bp, dom/imp, A64)** - Good practices guidelines, Eurostat and DG JRC (2013) and available official data
- **National IOTs (dom/imp, A64)** – Models B for product x product IOTs and Model D for industry x industry IOTs; and available official data
- **International trade statistics in goods and services trade** (see next slides)

3. Methodological framework (2/5)

Preparing data inputs:

- **Goods trade data**
 - ✓ EU COMEXT: Intrastat, Extrastat (CN-8 digit)
 - ✓ Manually adjusted reductions of trade asymmetries: corrections to the data
 - ✓ Other problems: missing trade partner; misclassification of products; confidential trade...
 - ✓ CIF/FOB margins adjustment (see Miao & Fortanier)
 - ✓ Weighted average of two reported values based on symmetry indexes -> reconciliation
 - ✓ Correspondence tables CN8->HS6->CPA

3. Methodological framework (3/5)

Preparing data inputs:

- **Services trade data**
 - ✓ Lack of available data / EBOPS categories
 - ✓ Top-down approach from Total Services (S200)
 - Total services with partner rest of the EU (gravity)
 - Split by EBOPS categories
 - Total services by partner country (gravity)
 - Split by EBOPS categorie
 - ✓ Balancing approach similar to goods trade data
 - ✓ EBOPS -> CPA using: conversion tables, SUIOTs, STEC

3. Methodological framework (4/5)

Preparing data inputs:

- **Aligning with National Accounts**
 - ✓ Goods sent for processing: not accounted any more as gross exports and gross imports in ESA2010
 - ✓ Merchanting transactions: trade data should reflect merchanting margins applied by the merchanting country and amounts paid by importer
 - ✓ Direct purchases abroad by residents (imp) and direct purchases by non-residents in the domestic territory (exp): typically included in NAs but not separated by product
 - ✓ Re-exports; countries may report only net trade in NAs
 - ✓ Unobserved transactions

3. Methodological framework (5/5)

Construction of EU IC-SUIOTs:

- ✓ **Trade values of the national SUTs are respected** (by product and reporting country)
- ✓ Although later changed possibly due to **revision of NAs**
- ✓ **Exports** by product and reporter country split **across trading partners** using balanced bilateral trade data
- ✓ Split **across users** with info from STEC, TEC, BEC and import use tables
- ✓ Further adjustments to **match national imports** by product and reporter country from national SUTs
- ✓ **IOTs:** adjust geographical shares to accommodate national IO tables (official and estimated)

4. Next steps

- **Two reports:** Inception Report and Report on the Review of the Methods for the construction of Global ICIO tables (end of April 2016)
- Define the **EU methodological framework** with support of the OECD (end of May 2016)
- Informal meetings with **trade statisticians** and the **OECD**
- Work on balancing bilateral trade data; compilation of missing SUIOTs and IT implementation of data management



Thank you for your attention!!

The FIGARO Project

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