The World Input-Output Database (WIOD) project

Robert Stehrer
The Vienna Institute for International Economic Studies (wiiw)
www.wiiw.ac.at
Robert.Stehrer@wiiw.ac.at

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The World Input-Output Database: General structure

EU project funded within the 7th framework programme

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Project started in May 2009; prospective end in April 2012

Construction and applications

- Construction of intercountry SUT/IO tables:
- Data become publicly available at end of project
- Applications
  - Socioeconomic issues
  - Environmental issues
  - (Policy) Modeling

Partners involved

- RUG (NL): University of Groningen (coordinator)
- IPTS (ES): Institute for Prospective Technology Studies
- wiiw (AT): The Vienna Institute for International Economic Studies
- ZEW (DE): Zentrum für Europäische Wirtschaftsforschung
- WIFO (AT): Österreichisches Institut für Wirtschaftsforschung
- HTWG (DE): Hochschule Konstanz
- TCBE (NL): The Conference Board Europe
- CPB (NL): Netherlands Bureau for Economic Policy Analysis
- ICCS (GR): Institute of Communication and Computer Systems
- CRSA (FR): Central Recherche SA
- OECD: not (yet) formally

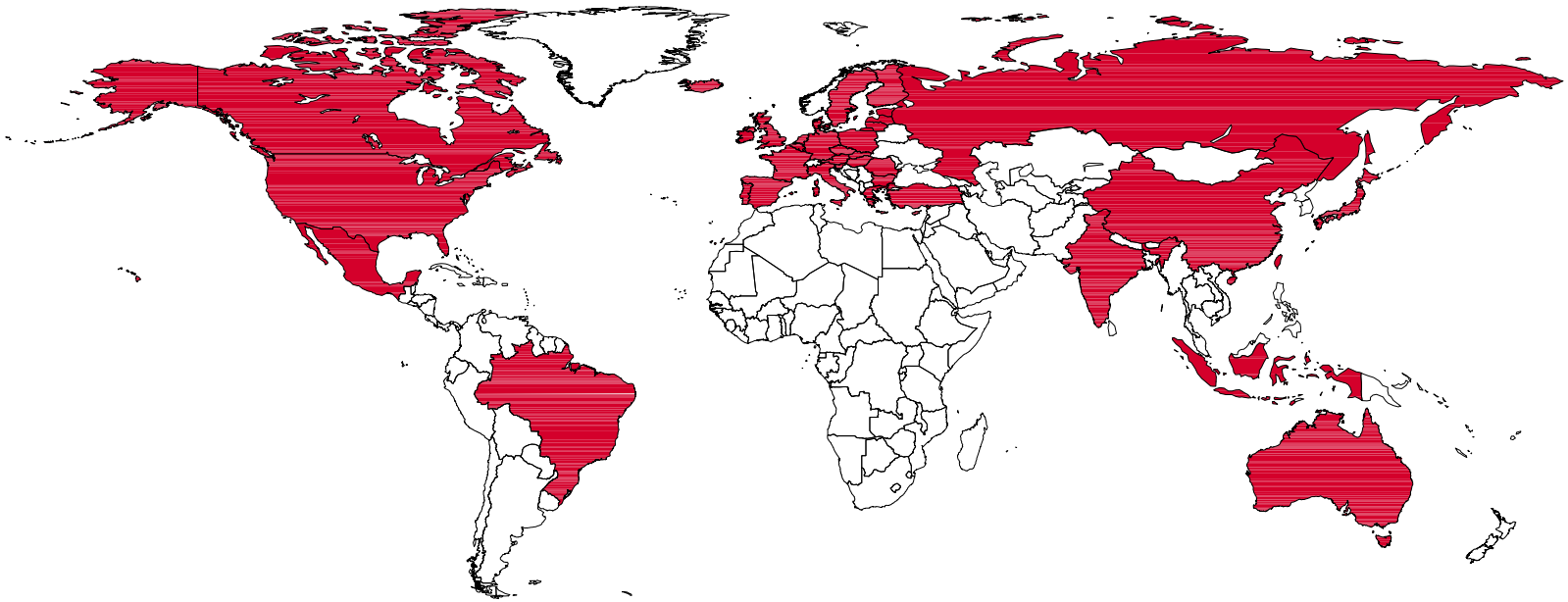
The World Input-Output (WIOD) Database: Overview

Data coverage

Data are collected by partners based on various datasources

- Intercountry Supply-Use and Input-Output tables
- 1995-2006
- 40 countries included
  - 27 EU countries
  - 26(+3/4) OECD members (accession/enhanced engagement)

WIOD country coverage



Data coverage

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- Intercountry Supply-Use and Input-Output tables
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- 40 countries included
  - 27 EU countries
  - 26(+3/4) OECD members (accession/enhanced engagement)
- Sectoral classifications
  - 60 products
  - 40 industries (NACE)
- Plus satellite accounts
- Attempts to create deflated tables

WIOD database: Core

- Harmonized Supply and Use (Make) tables and national IO tables
- Import tables
  - Import USE tables
  - Import IO tables
- Dataset of trade in goods (product level) and services (BOP codes)

Note: Coverage of SUT, IO and Import tables vary across countries and years (various sources, ...)

WIOD database: Satellite accounts

- Socioeconomic indicators
  - TFP, educational intensity, capital stock (ICT and Non-ICT), etc.

    (KLEMS type data)
  - Other: Intangible capital, etc.
  - FDI, Foreign affiliates, ...
- Environmental indicators
  - Energy use (various energy carrier)
  - Water use
  - Emissions
  - Others (waste)
- Might not have full coverage

Note: Coverage varies across countries and years (various sources, ...)

Applications

- Socioeconomic analysis
  - Factor content of trade
  - Effects of outsourcing on labor markets
  - Trade in value added, value added chains, ...
- Environmental analysis
- Modeling
  - CGE modeling
  - Dynamic IO-based modeling

The World Input-Output (WIOD) Database:

Construction issues

Ideally ...

(1) Balanced SUT system consistent with NA ...

Table 1.3: A simplified supply and use framework

		Products			Industries			Final uses			Total
		Agri-cultural products	Industrial products	Services	Agri-culture	Industry	Service activities	Final con-sumption	Gross capital formation	Exports	
Products	Agricultural products Industrial products Services				Intermediate consumption by product and by industry			Final uses by product and by category			Total use by product
Industries	Agriculture Industry Service activities	Output of industries by product									Total output by industry
Value added					Value added by component and by industry						Total value added
Imports		Total imports by product									Total imports
Total		Total supply by product			Total output by industry			Total final uses by category			

= not applicable

Source: Eurostat Manual of Supply, Use and Input-Output Tables

... (2) with import use tables ...

Table 7.1: Use table for imports

	INDUSTRIES (NACE) / PRODUCTS (CPA)	INDUSTRIES (NACE)							FINAL USES									
		Agriculture	Industry	Construction	Trade, hotel, transport	Finance, real estate, business	Other service activities	Total	Final consumption expenditure by households	Final consumption expenditure by non-profit organisations	Final consumption expenditure by government	Gross fixed capital formation	Changes in valuables	Changes in inventories	Exports intra EU FOB	Exports extra EU FOB	Total	Total use at basic prices
No		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	Products of agriculture	Imported products for intermediate consumption at c.i.f. values						Imported intermediates	Imported products for final uses at c.i.f. values								Imported final uses	Imported total uses
2	Products of industry																	
3	Construction work																	
4	Trade, hotel, transport																	
5	Financial, real, business																	
6	Other services																	
7	Total at basic prices	Intermediate consumption by industry							Final uses by category									

= Import vector of the supply table

Source: Eurostat Manual of Supply, Use and Input-Output Tables

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(3) and bilateral trade data consistent with SUT/IO trade vectors

Construction of inter-country tables

Assuming (1) and (2) is satisfied; but (3) does not hold

- Trade data based approach
  - Fix (bilateral) trade data and adjust IO tables to them
    - Not considering trade in intermediate inputs
    - Considering trade in intermediate inputs

      (basically applying proportionality assumption)

Construction of inter-country tables

Assuming (1) and (2) is satisfied; but (3) does not hold

- Trade data based approach
  - Fix (bilateral) trade data and adjust IO tables to them
    - Not considering trade in intermediate inputs
    - Considering trade in intermediate inputs

      (basically applying proportionality assumption)
- SUT/IO tables based approach
  - Use SUT/IO data from NSI sources and 'adapt' trade data
    - Benchmark to import (export) columns in SUT data
  - Use (bilateral) trade data to break down by country of origin or destination
    - Use end-use categories (BEC) to differentiate between ID and FD

Discussion: Trade data based approach

+ Balanced and reconciled trade data available (or routines)
+ Relies on Social Accounting Matrix (SAM) approach (CGE modeling literature)
+ Additional countries might be included rather easily

  Does not require to adjust bilateral trade data matrix

– Intermediate trade in goods (if at all): proportionality assumption used
– Changes in existing IO tables (e.g. RAS procedure)
– Based on IO tables rather than SUT framework

Discussion: SUT/IO data based approach

+ Based on SUT framework (more flexibility)
+ Based on existing SUT/IO data (in some cases linked to NA data)
+ Trade figures at product level
+ Using industry of imported intermediate products is better measured
– Adjustment of trade figures (balancing, overall constraints, ...)
– Including additional country requires recalculation of trade data

(change in bilateral trade flows if SUT/IO trade columns differ from trade data)

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... feasible approach for

- rather small and fixed set of countries
- and rather aggregated product/industry level

In practice:

- Construction/interpolation of SUT and import tables
  [Requirements (1a), (1b) and (2)]
- Construction of internally consistent trade data
  [Requirements (3a)]
- 2-way interaction between use of SUT/IO and trade data
  [Exchange of information making/justifying assumptions]
- Construction will require (ad-hoc) assumptions and 'guesstimations'
  - Comparisons
  - Documentation

WIOD construction: Ongoing work

Data issues: WIOD supply and use tables

- Construction/Interpolation of missing tables
- Construction of inter-country SUT tables from benchmark tables
  - First use information from import SUT tables to ...
    - ... split imports into demand categories (II, final demand, ...)
    - ... to calculate use of imported products by industry for II
  - Use international trade data to split cells in import USE matrix by sourcing country

Data issues: Trade in goods

- Correspondence HS6 to NACE and HS6 to BEC
  $\Rightarrow$ HS6-NACE-BEC
- Alternative to BEC/Adaption of BEC?
- Balancing, reconciling and benchmarking with data from SUT/IO
  - (Well-known) Data problems: Missing trade, confidentials, re-exports and re-imports, mirror flows

Data issues: Trade in services

- Bilateral service trade data from various sources
  - UN, IMF, Eurostat, OECD, WTO, (IIDE-TSD))
- Data problems
  - Coverage
  - Internal consistency and consistency across databases (Documentation)
  - Correspondence BOP to sector/product level
- Service exports and imports by country and WIOD sectors (though even aggregate)
  - Balancing and mirror flows
  - Construction of full bilateral data set (Gravity type model, RAS based approach,...)

Forthcoming events:

December 3-4, 2009: Internal project meeting, OECD, Paris, France.

May 26-28, 2010: WIOD conference, Vienna, Austria.

Thank you for attention!

www.wiod.org

Comments to: Robert.Stehrer@wiiw.ac.at