

Expanding the geographical coverage of OECD's TiVA database to include more developing countries – recent experiences

Norihiko Yamano^a and Colin Webb^a

^a OECD, Paris, France

Abstract

This paper provides an overview of the experience gained during the recent expansion of the OECD's Inter-Country Input-Output (ICIO) and Trade in Value Added (TiVA) databases, which now include ten more developing countries (76 countries in total). The expansion was made in response to the increasing importance of developing economies in the global economy, as reflected by their increased shares in GDP, trade flows, number of households and population. The inclusion of the most populous countries enables the Inter-Country Input-Output model to be used to derive more robust indicators on social impacts of globalisation, particularly regarding energy and food security issues and carbon footprints. To be included in the OECD's ICIO model, ideal and minimum requirements of available national statistics required for inclusion are identified. The bilateral statistics meetings were held with target countries. The participants in these statistical data collection sessions included National Accounts and Supply and Use table compilation teams at the national statistics offices, Balance of Payments compilers at central banks, Merchandise Trade statistics in Customs agencies and consultants from international organisations.

Keywords:

Developing economies; Inter-Country Input-Output; Global Value Chains

1. Introduction

This paper provides an overview of the experience gained during the recent expansion of the OECD's Inter-Country Input-Output (ICIO) and Trade in Value Added (TiVA) databases during which ten more developing countries were added in response to the emergence of non-G20 and non-OECD economies in recent decades. The increasing importance of developing economies in the global economy is reflected by their increased shares in GDP, trade flows, number of households, and population. According to the UN National Accounts Main Aggregate database, the sum of GDP shares of non-G20 and non-OECD economies increased from 7% in 1995 to 11% in the early 2020s. Moreover, the exports of goods and services from these economies now account for about 20% of global trade flows.

The latest edition of the TiVA database includes 76 countries, ten more than the previous edition (2021 edition). The expansion added five African countries (Cameroon, Côte d'Ivoire, Egypt, Nigeria and Senegal), two South Asian countries (Bangladesh and Pakistan), and two Eastern European countries (Belarus and Ukraine). Inclusion of the most populous countries with populations of over 100 million, namely Pakistan, Nigeria, Bangladesh, and Egypt, enables the Input-Output model to be used to derive more robust indicators, particularly regarding carbon footprints and food security issues.

To be included in the TiVA database, OECD has defined ideal and minimum requirements of available national statistics required for inclusion in the underlying ICIO tables. No country meets the ideal requirements (e.g. time-series of Supply and Use Tables from the mid-1990s, consistent with latest 2008 SNA time series and with the necessary level of industry and product disaggregation; and, detailed bilateral trade in goods and services statistics) although some countries come relatively close. With an eye on the minimum requirements, the first step was to compile published national statistics and review their coverage and quality, digesting the format and classification systems used in each data source, detection of outliers, and harmonising national format to the standard format used as an input to ICIO construction. Where appropriate, notably during 'formal' projects, a statistical assessment report was produced and shared with the relevant national statistics providers. Bilateral online and in-person meetings were then held with national statisticians, consultants and other stakeholders to discuss best practices; availability of unpublished statistics that could be shared; and, determine improvements that could be made to national statistics, and the challenges faced, in the short- and medium-term, to improve the quality of TiVA indicators.

Increasing geographical coverage also involves a range of technical and methodological challenges when developing the ICIO tables.¹ Decreasing the share of the "rest of the world" in the model in principle improves the overall inter-industry linkages across countries. However, it increases the chance of starting the balancing procedures of intercountry flows with greater discrepancies in the model's initial values at the same time. Another technical challenge is that the increased number of target economies and extended years of coverage raises the processing, memory and storage pressures in the computing environment.

Once individual countries are included in the ICIO/TiVA framework, the industry and trade structures become fully comparable with other countries, and a suite of indicators becomes available. Despite the challenges of the underlying statistical preparations, further expansion of country

¹ The Input-Output embedded models with large number of developing countries include GTAP version 11 (141 individual target countries, Aguiar et al., 2022), Eora 2023 (189 individual target countries, <https://worldmrio.com/metadata.jsp>, Lenzen et al 2012 for database construction),

coverage is essential to derive more reliable indicators for regional value chains under the evolution of trade agreements with neighbouring economies.

The rest of this article describes the methodology and data used to estimate the employment sustained by global production networks. The third section provides the results of employment and compensation of employees sustained by foreign demand. The last section summarises the empirical findings of the target economies and list the opportunities of the future extensions.

2. Development procedure of ICIO model

2.1 Overall procedure

There are four major steps for compiling the OECD ICIO as follows:

1. **Compilation of statistics and harmonised SNA constraints.** For each country, the following statistics from various national, regional and international statistical agencies are collected, validated and processed: National Accounts (SNA) main aggregates, SUTs, IOTs, industry output and value added, and household consumption data (HC-COICOP); Balance of Payments (BoP); Tourism Satellite Accounts (TSA); bilateral merchandise trade statistics (Customs); and, bilateral Trade in Services (TIS). Tables of SNA constraints for the target years are generated for each country, with any gaps filled with estimates using alternative sources. The aim is to collect statistics, and produce constraints tables, for more than 190 countries, although when compiling statistics beyond established international sources (such as UN National Accounts and Comtrade), the priority is for published target countries, and candidate countries.
2. **Estimation of balanced trade flows.** This involves three key procedures: i) balancing total exports and imports by country at the global level; ii) balancing exports and imports by industry and product group. This may involve several rounds of “exploratory balancing” and adjustments to ensure the estimates of exports and imports by product and industry are consistent with the estimates of output by product and industry; and, iii) balancing bilateral trade flows. The methodology used in the ICIO estimation process provides room for inclusion of additional constraints in order to maximise the use of official statistics. Direct purchases by non-residents, imported products for consumption by foreign residents, re-exports and re-imports are adjusted at the product level at this stage. Making this is a unique approach compared to existing approaches in the current literature.
3. **Estimation of harmonised national Supply and Use tables.** Drawing on available national tables, time series of SUTs (or, if necessary, IOTs) *at basic prices* and Use tables *at purchasers’ prices* are estimated under the SNA aggregate and sectoral constraints. If the sectoral details are not available for a specific country, average production structures of other countries are used as initial values to start the balancing procedure. Extrapolation and interpolation techniques are applied only for missing information.
4. **Generation of Inter-Country use tables (ICUT).** Finally, the inter-country transaction flows are estimated using the international harmonised data sources of national SUTs and balanced trade partner shares of previous steps. Then, the product

dimension of rows in ICUT are converted to industry dimension (Inter-Country Input-Output) using national product – industry supply ratios.

2.2 Administrative procedures of additional countries

Expanding the target countries of TiVA database requires significant administrative effort and data collection. To ensure the effective meetings, in-person bilateral meetings and plenary policy discussion sessions are essential particularly for the countries with limited online network capacities. The participants in these statistical capacity building exercises included National Accounts and Supply-Use compilation teams at the national statistics offices, consultants for international organisations, Balance of Payments compilers at Central Banks, and merchandise trade statistics and Customs agencies or finance ministries. Examples of common issues facing statistical agencies in developing countries are 1) high turnover of staff members to retain institutional memory, 2) availability of survey results and administrative records in electronic format for earlier years, 3) unique classification formats of products and industry dimensions for certain years due to limited resources to conduct regular economic census surveys 4) multiple activities of various technical assistance initiatives.

3. Data Availability for target economies

Data assessment reports are drafted for many target economies of ICIO 2022 edition prior to bilateral online sessions and in-person meetings. The report typically includes an initial assessment of the quality and coverage of target countries' current national statistics required for inclusion in the TiVA database (see Annex 2 and Annex 3). It outlines areas where capacity building initiatives could be suggested to help strengthen the quality and frequency of statistics publications.

Inclusion of a country in the suite of Trade in Value Added (TiVA) indicators (<http://oe.cd/tiva>) necessarily requires inclusion in OECD's Inter-Country Input-Output (ICIO) database (<http://oe.cd/icio>) and the data assessment report describes and reviews relevant national statistics identified from various sources. In particular, Supply and Use Tables (SUTs), other National Accounts (SNA) statistics and, international trade in goods and in services statistics. Note however, that this report only reflects what the OECD has found so far and may not fully cover all national statistics that are currently available.

The purpose of these data assessment reports is to provide a foundation for bilateral meetings between national statistics agencies, international experts and the ICIO development team at the OECD. During these meetings with national experts during which the current, and potential, availability and quality of national statistics were be discussed, as well as the feasibility of national project co-ordinators providing additional data to the OECD. Following these discussions, the OECD has developed a set of recommendations on improving the availability of data sources with the help of national experts.

Overview of data availability from national and international sources for each country is briefly summarised for different statistics sources (See examples for Nigeria in Tables 1, 2 and 3). The information presented in these tables highlight any limitations or gaps in the data sources those could affect the reliability of developing the ICIO database. The availability information presented in these tables include: detailed variables of National Accounts, Supply and Use tables at different price

valuation format, number of partners provided in the bilateral trade statistics in goods (Merchandise trade statistics) and services (Balance of Payments).

Table 1: Overview of data availability from national and international sources (Nigeria)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
SNA - Main aggregates	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SNA - Taxes less subsidies on products (If NA, VA is not at basic prices)	-	-	-	Y*								
SNA - Expenditures by non-residents	-	-	-	-	-	-	-	-	-	-	Y*	Y*
SNA - Exports of goods and services	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
BOP Travel	-	-	-	-	-	-	-	-	-	-	-	-
BOP Personal Travel	-	-	-	-	-	-	-	-	-	-	-	-
Supply table	-	-	-	-	-	-	-	-	-	-	-	-
Use table at purchaser's prices	-	-	-	-	-	-	-	-	-	-	-	-
Use table at basic prices	-	-	-	-	-	-	-	-	-	-	-	-
Use table at producers' prices	-	-	-	-	-	-	-	-	-	-	-	-
Input-Output table (Industry by Industry)	-	-	-	-	-	-	-	-	-	-	-	-
Input-Output table (Product by Product)	-	-	-	-	-	-	-	-	-	-	-	-
Input-Output table at producers' prices	-	-	-	-	-	-	-	-	-	-	-	-
Import table	-	-	-	-	-	-	-	-	-	-	-	-
Merchandise trade statistics (Exports) - no of partners	-	95	57	65	92	62	47	49	67	-	-	77
Merchandise trade statistics (Imports) - no of partners	-	130	133	128	150	159	171	157	168	-	-	176
Trade in services by partner (Exports) - no of partners	#	#	#	#	#	#	#	#	#	#	#	#
Trade in services by partner (Imports) - no of partners	#	#	#	#	#	#	#	#	#	#	#	#
Re-exports and re-imports reported	-	-	-	-	-	-	-	-	-	-	-	-
Tourism Satellite Account	-	-	-	-	-	-	-	-	-	-	-	-

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
SNA - Main aggregates	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
SNA - Taxes less subsidies on products (If NA, VA is not at basic prices)	Y*	Y*	Y*	Y	Y	Y	Y	Y	Y	Y	Y	Y
SNA - Expenditures by non-residents	Y*	Y*	Y*	-	-	-	-	-	-	-	-	-
SNA - Exports of goods and services	-	-	-	-	-	-	-	-	-	-	-	-
BOP Travel	-	-	-	-	-	-	-	-	-	-	-	-
BOP Personal Travel	-	-	-	-	-	-	-	-	-	-	-	-
Supply table	-	-	-	Y	-	-	-	-	-	-	-	-
Use table at purchaser's prices	-	-	-	Y	-	-	-	-	-	-	-	-
Use table at basic prices	-	-	-	-	-	-	-	-	-	-	-	-
Use table at producers' prices	-	-	-	-	-	-	-	-	-	-	-	-
Input-Output table (Industry by Industry)	-	-	-	-	-	-	-	-	-	-	-	-
Input-Output table (Product by Product)	-	-	-	-	-	-	-	-	-	-	-	-
Input-Output table at producers' prices	-	-	-	-	-	-	-	-	-	-	-	-
Import table	-	-	-	-	-	-	-	-	-	-	-	-
Merchandise trade statistics (Exports) - no of partners	114	132	126	128	124	137	139	146	147	112	111	113
Merchandise trade statistics (Imports) - no of partners	170	171	149	143	142	154	169	175	170	161	177	177
Trade in services by partner (Exports) - no of partners	#	#	#	#	#	#	#	#	#	#	#	#
Trade in services by partner (Imports) - no of partners	#	#	#	#	#	#	#	#	#	#	#	#
Re-exports and re-imports reported	-	-	-	-	-	-	-	-	-	-	-	-
Tourism Satellite Account	-	-	-	-	-	-	-	-	-	-	-	-

Note:

Y: Available, * SNA 1993, BPM5 or EBOPS 2002 definition

(October 2020)

Table 2: Overview of coverage of SNA Main aggregate statistics (Nigeria)

	SNA 1993	SNA 2008
GDP	1998-2012	1995-2018
Final consumption expenditure	1998-2012	1995-2018
Household final consumption expenditure	-	1995-2018
NPISHs final consumption expenditure	-	1995-2018
Household final consumption expenditure (+ NPISHs)	1998-2012	-
General government final consumption expenditure	1998-2012	1995-2018
Gross capital formation	1998-2012	1995-2018
Gross fixed capital formation	1998-2012	1995-2018
Changes in inventories	1998-2012	1995-2018
Exports of goods and services	1998-2012	1995-2018
Exports of goods	2007-2012	2010-2018
Exports of services	2007-2012	2010-2018
Imports of goods and services	1998-2012	1995-2018
Imports of goods	2007-2012	2010-2018
Imports of services	2007-2012	2010-2018

Table 3: Overview on coverage of Balance of Payment service categories (Nigeria)

	Credit	Debit
Services	1995-2018	1995-2018
Transport,	1995-2018	1995-2018
Passenger	1995-2018	1995-2018
Freight	1995-2018	1995-2018
Other (including postal and courier)	1995-2018	1995-2018
Travel,	1995-2018	1995-2018
Business travel,	2006-2018	2006-2018
Personal travel,	2006-2018	2006-2018
Other services,	1995-2018	1995-2018
Construction services	2006-2018	2005-2018
Insurance and pension services	1995-2018	1995-2018
Financial services	2005-2018	2005-2018
Charges for the use of intellectual property n.i.e.	2006-2018	2005-2018
Telecommunication, computer, and information services	2005-2018	2005-2018
Other business services	1995-2018	1995-2018
Personal, cultural, and recreational services	2006-2018	2005-2018
Government goods and services n.i.e.	2005-2018	2005-2018
Manufacturing services on physical inputs owned by others,	2015-2018	2015-2018
Maintenance and repair services n.i.e.,	2015-2018	2015-2018

4. Summary

The OECD Inter-Country Input-Output (ICIO) tables include notable features for consistent globalisation analyses. The estimates for each country included in this database tables are basically constrained to official National Accounts variables. Thus, GDP estimates from expenditures, output and income approaches are consistently harmonised and the trade balance of each country covers both cross border trade flows and direct purchases by non-residents.

Some analyses such as those related to global environmental and sustainable development goals could be potentially improved by additional mining products exporters and populous developing economies in South Asian and African countries. In addition to increasing the target countries, the quality of ICIO tables and the analytical results from this database can be improved in many methodological enhancements. Some examples are noted below.

- The conversion of National Accounts constraints in fiscal year to Gregorian calendar year can be extended to all components of National Accounts variables.
- The balancing the different components of ICIOs can be made at more detailed sector levels.
- Revisiting the estimates of SUTs and IOTs when the National Accounts benchmark revisions are made.

Lastly, many statistical and methodological challenges in developing economies remain to improve the coverage and quality of ICIO databases. It requires a collaborative effort among national statistics agencies, international organisations and other relevant policy makers to ensure that the data preparation is sustainable the economies to be continuously included in the ICIO/TiVA databases.

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Annex 1

Table A.1 List of economies

ISO 3166-1 alpha-3	Name	National Accounts	Underlying IClO system	TIVA 2021-2023	GTAP11	EORA 2023	ISO 3166-1 alpha-3	Name	National Accounts	Underlying IClO system	TIVA 2021-2023	GTAP11	EORA 2023
ABW	Aruba			ROW			LVA	Latvia					
AFG	Afghanistan	1	1	ROW	1	1	MAC	Macao SAR, China	1	1	ROW	1	1
AGO	Angola	1	1	ROW	1	1	MAR	Morocco	1	1	1	1	1
ALB	Albania	1	1	ROW	1	1	MCO	Monaco	1	1	ROW	1	1
ARE	United Arab Emirates	1	1	ROW	1	1	MDA	Moldova	1	1	ROW	1	1
ARG	Argentina	1	1	1	1	1	MDG	Madagascar	1	1	ROW	1	1
ARM	Armenia	1	1	ROW	1	1	MDV	Maldives	1	1	ROW	1	1
ATG	Antigua and Barbuda	1	1	ROW	1	1	MEX	Mexico	1	1	1	1	1
AUS	Australia	1	1	1	1	1	MHL	Marshall Islands	1	1	ROW	1	1
AUT	Austria	1	1	1	1	1	MKD	North Macedonia	1	1	ROW	1	1
AZE	Azerbaijan	1	1	ROW	1	1	MLI	Mali	1	1	ROW	1	1
BDI	Burundi	1	1	ROW	1	1	MLT	Malta	1	1	1	1	1
BEL	Belgium	1	1	1	1	1	MMR	Myanmar	1	1	1	1	1
BEN	Benin	1	1	ROW	1	1	MNE	Montenegro	1	1	ROW	1	1
BFA	Burkina Faso	1	1	ROW	1	1	MNG	Mongolia	1	1	ROW	1	1
BGD	Bangladesh	1	1	1	1	1	MOZ	Mozambique	1	1	ROW	1	1
BGR	Bulgaria	1	1	1	1	1	MRT	Mauritania	1	1	ROW	1	1
BHR	Bahrain	1	1	ROW	1	1	MUS	Mauritius	1	1	ROW	1	1
BHS	Bahamas	1	1	ROW	1	1	MWI	Malawi	1	1	ROW	1	1
BIH	Bosnia Herzegovina	1	1	ROW	1	1	MYS	Malaysia	1	1	1	1	1
BLR	Belarus	1	1	1	1	1	NAM	Namibia	1	1	ROW	1	1
BLZ	Belize	1	1	ROW	1	1	NER	Niger	1	1	ROW	1	1
BMU	Bermuda	1	1	ROW	1	1	NGA	Nigeria	1	1	1	1	1
BOL	Bolivia	1	1	ROW	1	1	NIC	Nicaragua	1	1	ROW	1	1
BRA	Brazil	1	1	1	1	1	NLD	Netherlands	1	1	1	1	1
BRB	Barbados	1	1	ROW	1	1	NOR	Norway	1	1	1	1	1
BRN	Brunei	1	1	1	1	1	NPL	Nepal	1	1	ROW	1	1
BTN	Bhutan	1	1	ROW	1	1	NZL	New Zealand	1	1	1	1	1
BWA	Botswana	1	1	ROW	1	1	OMN	Oman	1	1	ROW	1	1
CAF	Central African Republic	1	1	ROW	1	1	PAK	Pakistan	1	1	1	1	1
CAN	Canada	1	1	1	1	1	PAN	Panama	1	1	ROW	1	1
CHE	Switzerland	1	1	1	1	1	PER	Peru	1	1	1	1	1
CHL	Chile	1	1	1	1	1	PHL	Philippines	1	1	1	1	1
CHN	China	1	1	1	1	1	PLW	Palau	1	1	ROW	1	1
CIV	Côte d'Ivoire	1	1	1	1	1	PNG	Papua New Guinea	1	1	ROW	1	1
CMR	Cameroon	1	1	1	1	1	POL	Poland	1	1	1	1	1
COD	Democratic Republic of the Congo	1	1	ROW	1	1	PRI	Puerto Rico	1	1	ROW	1	1
COG	Congo	1	1	ROW	1	1	PRK	DPR of Korea	1	1	ROW	1	1
COL	Colombia	1	1	1	1	1	PRT	Portugal	1	1	1	1	1
COM	Comoros	1	1	ROW	1	1	PRY	Paraguay	1	1	ROW	1	1
CPV	Cabo Verde	1	1	ROW	1	1	PSE	Palestine, State of	1	1	ROW	1	1
CRI	Costa Rica	1	1	1	1	1	QAT	Qatar	1	1	ROW	1	1
CUB	Cuba	1	1	ROW	1	1	ROU	Romania	1	1	1	1	1
CYP	Cyprus	1	1	1	1	1	RUS	Russian Federation	1	1	1	1	1
CZE	Czech Republic	1	1	1	1	1	RWA	Rwanda	1	1	ROW	1	1
DEU	Germany	1	1	1	1	1	SAU	Saudi Arabia	1	1	1	1	1
DJI	Djibouti	1	1	ROW	1	1	SDN	Sudan	1	1	ROW	1	1
DMA	Dominica	1	1	ROW	1	1	SEN	Senegal	1	1	1	1	1
DNK	Denmark	1	1	1	1	1	SGP	Singapore	1	1	1	1	1
DOM	Dominican Republic	1	1	ROW	1	1	SLB	Solomon Islands	1	1	ROW	1	1
DZA	Algeria	1	1	ROW	1	1	SLE	Sierra Leone	1	1	ROW	1	1
ECU	Ecuador	1	1	ROW	1	1	SLV	El Salvador	1	1	ROW	1	1
EGY	Egypt	1	1	1	1	1	SRB	Serbia	1	1	ROW	1	1
ERI	Eritrea	1	1	ROW	1	1	SSD	South Sudan	1	1	ROW	1	1
ESP	Spain	1	1	1	1	1	STP	Sao Tome and Principe	1	1	ROW	1	1
EST	Estonia	1	1	1	1	1	SUR	Suriname	1	1	ROW	1	1
ETH	Ethiopia	1	1	ROW	1	1	SVK	Slovakia	1	1	1	1	1
FIN	Finland	1	1	1	1	1	SVN	Slovenia	1	1	1	1	1
FJI	Fiji	1	1	ROW	1	1	SWE	Sweden	1	1	1	1	1
FRA	France	1	1	1	1	1	SWZ	Eswatini	1	1	ROW	1	1
FSM	Micronesia	1	1	ROW	1	1	SYC	Seychelles	1	1	ROW	1	1
GAB	Gabon	1	1	ROW	1	1	SYR	Syrian Arab Republic	1	1	ROW	1	1
GBR	United Kingdom	1	1	1	1	1	TCO	Chad	1	1	ROW	1	1
GEO	Georgia	1	1	ROW	1	1	TGO	Togo	1	1	ROW	1	1
GHA	Ghana	1	1	ROW	1	1	THA	Thailand	1	1	1	1	1
GIN	Guinea	1	1	ROW	1	1	TJK	Tajikistan	1	1	ROW	1	1
GMB	Gambia	1	1	ROW	1	1	TKM	Turkmenistan	1	1	ROW	1	1
GNB	Guinea-Bissau	1	1	ROW	1	1	TLS	Timor-Leste	1	1	ROW	1	1
GNQ	Equatorial Guinea	1	1	ROW	1	1	TON	Tonga	1	1	ROW	1	1
GRC	Greece	1	1	1	1	1	TTO	Trinidad and Tobago	1	1	ROW	1	1
GRD	Grenada	1	1	ROW	1	1	TUN	Tunisia	1	1	1	1	1
GRL	Greenland	1	1	ROW	1	1	TUR	Turkey	1	1	1	1	1
GTM	Guatemala	1	1	ROW	1	1	TWN	Chinese Taipei	1	1	1	1	1
GUM	Guam	1	1	ROW	1	1	TZA	Tanzania	1	1	ROW	1	1
GUY	Guyana	1	1	ROW	1	1	UGA	Uganda	1	1	ROW	1	1
HKG	Hong Kong SAR, China	1	1	1	1	1	UKR	Ukraine	1	1	1	1	1
HND	Honduras	1	1	ROW	1	1	URY	Uruguay	1	1	ROW	1	1
HRV	Croatia	1	1	1	1	1	USA	United States of America	1	1	1	1	1
HTI	Haiti	1	1	ROW	1	1	UZB	Uzbekistan	1	1	ROW	1	1
HUN	Hungary	1	1	1	1	1	VCT	Saint Vincent and the Grenadines	1	1	ROW	1	1
IDN	Indonesia	1	1	1	1	1	VEN	Venezuela (Bolivarian Republic of)	1	1	ROW	1	1
IND	India	1	1	1	1	1	VNM	Vietnam	1	1	1	1	1
IRL	Ireland	1	1	1	1	1	VUT	Vanuatu	1	1	ROW	1	1
IRN	Iran	1	1	ROW	1	1	WSM	Samoa	1	1	ROW	1	1
IRQ	Iraq	1	1	ROW	1	1	YEM	Yemen	1	1	ROW	1	1
ISL	Iceland	1	1	1	1	1	ZAF	South Africa	1	1	1	1	1
ISR	Israel	1	1	1	1	1	ZMB	Zambia	1	1	ROW	1	1
ITA	Italy	1	1	1	1	1	ZWE	Zimbabwe	1	1	ROW	1	1
JAM	Jamaica	1	1	ROW	1	1	AIA	Anguilla	1	ROW	ROW	1	1
JOR	Jordan	1	1	1	1	1	AND	Andorra	1	ROW	ROW	1	1
JPN	Japan	1	1	1	1	1	ANT	Netherlands Antilles	1	ROW	ROW	1	1
KAZ	Kazakhstan	1	1	1	1	1	COK	Cook Islands	1	ROW	ROW	1	1
KEN	Kenya	1	1	ROW	1	1	CUW	Curaçao	1	ROW	ROW	1	1
KGZ	Kyrgyzstan	1	1	ROW	1	1	CYM	Cayman Islands	1	ROW	ROW	1	1
KHM	Cambodia	1	1	1	1	1	MSR	Montserrat	1	ROW	ROW	1	1
KIR	Kiribati	1	1	ROW	1	1	NRU	Nauru	1	ROW	ROW	1	1
KNA	Saint Kitts and Nevis	1	1	ROW	1	1	PYF	French Polynesia	1	ROW	ROW	1	1
KOR	Republic of Korea	1	1	1	1	1	TUV	Tuvalu	1	ROW	ROW	1	1
KWT	Kuwait	1	1	ROW	1	1	VBG	British Virgin Islands	1	ROW	ROW	1	1
LAO	Laos	1	1	1	1	1	BES	Bonaire, Sint Eustatius and Saba	1	ROW	ROW	1	1
LBN	Lebanon	1	1	ROW	1	1	ESH	Western Sahara	1	ROW	ROW	1	1
LBR	Liberia	1	1	ROW	1	1	NCL	New Caledonia	1	ROW	ROW	1	1
LBY	Libya	1	1	ROW	1	1	SMR	San Marino	1	ROW	ROW	1	1
LCA	Saint Lucia	1	1	ROW	1	1	SOM	Somalia	1	ROW	ROW	1	1
LIE	Liechtenstein	1	1	ROW	1	1	VAT	Vatican	1	ROW	ROW	1	1
LKA	Sri Lanka	1	1	ROW	1	1	VXX	Kosovo	1	ROW	ROW	1	1
LSO	Lesotho	1	1	ROW	1	1							
LTU	Lithuania	1	1	1	1	1							
LUX	Luxembourg	1	1	1	1	1							

Annex 2 - Ideal requirements for inclusion in OECD ICIO Tables and TiVA database

Ideally, countries would be able to provide the following annual statistics, on a regular basis with time series going back to 1995.

Annual time series of Supply and Use tables (SUTs), covering, at least, the industries (and equivalent products) described in Annex Table 1.

- The tables should be compiled in accordance with the 1993 or 2008 System of National Accounts (SNA). If data are compiled according to the 2008 SNA countries should provide supplementary information describing how merchandise trade statistics have been adjusted to reflect the recent changes introduced in the 2008 SNA for ‘Goods for Processing’. Additional information should also be provided describing adjustments made for ‘Merchanting’ activities.

The SNA recommends that all Intermediate Consumption transactions in Use tables are recorded on a “Purchasers’ Prices” basis. For the construction of Inter-Country Input-Output (ICIO) tables, all intermediate consumption transactions should also be made available on a “Basic Prices” basis, with complementary tables showing the differences between Purchasers’ Prices’ and Basic Prices, split into a “Distribution Margin’ component and a “Taxes and Subsidies’ component. Ideally these should be broken down to provide more detail. So, for example, the Distribution component could be split separately into Margins provided by Wholesalers, Retailers, Transport and Other industries as relevant. Similarly, Taxes and Subsidies could be split by the specific type of tax or subsidy, in particular any import taxes.

- Similar breakdowns of transactions in Purchasers’ Prices– into, at least, Margin and Taxes/Subsidies tables - should also be provided for all categories of Final Demand (Household Final Consumption, General Government Final Consumption, Non-Profit Institutions Serving Households, Gross Fixed Capital Formation, Valuables, Changes in Inventories and Exports).
- Use tables at purchasers’ prices should be split into three: A domestic table showing all purchases of goods and services provided directly by domestic industries; an Import table, showing all purchases of imported goods and services; and Net taxes on products (VAT, import duties, other taxes and subsidies).
- Within the SUTs: Resident household expenditure abroad should be shown separately as part of total imports and broken down into specific products. Similarly, Non-Resident household expenditure in the host economy should be shown separately and broken down by specific products.
- Supply tables must include the “Make’ matrix which shows the types of products produced by industries in Basic Prices. Supplementary columns for Imports, Distribution margins, and Taxes and Subsidies should also be included, as specified in the SNA.
- Imports in the Supply column should be provided on both a C.I.F basis, with total imports on a F.O.B basis. The C.I.F F.O.B adjustment should be broken down into a complementary column allocated to each specific product such that all transactions in goods are shown on a F.O.B basis. If possible, any information on the country source of the C.I.F. component should be provided

Bilateral Trade in Goods (Merchandise Trade Statistics) should be produced at the 6-digit level of the Harmonised System (HS). Transactions should be shown on both an F.O.B and C.I.F. basis.

- Bilateral Merchandise Trade Statistics should be made as coherent as possible with partner countries' reported bilateral trade. Where significant asymmetries exist (e.g. between a country's reported exports and their partner's reported imports) possible reasons should be highlighted, if known.
- Estimates should also be made available on an aggregated basis at the same product level used in national SUTs. The concordance relationship used to aggregate HS products to product groupings in the Supply Use tables should also be provided.
- A description of any adjustments made to merchandise trade statistics to populate the Imports and Exports columns in the SUTs should be provided. In particular, for transactions concerning 'Goods for Processing' and 'Merchanting', if relevant.
- Confidential trade: In some countries, disclosure rules suppress reporting merchandise trade at the 6-digit level of HS. Where this is the case, impacts on statistics at the higher 2-digit HS chapter level should be avoided. For example, by adopting other forms of preserving confidentiality, such as suppressing one or more other 6-digit HS categories.
- Information on Re-exports should be provided, ideally by product, origin and destination - differentiating between transit trade and trade passing through entrepôts where distribution margins are often incurred. Information on Re-imports should be provided too.
- 6-digit HS codes, as reported in UN's COMTRADE database, cannot differentiate between new and old capital goods (such as second-hand aircraft, ships, and cars). Any additional information that can be provided to identify these flows should be provided.
- Unidentified scrap and waste: Certain types of waste and scrap do not have separate 6-digit HS codes e.g. PCs and other electrical equipment exported (often to developing countries) for recycling. Any additional information to identify these flows should be provided.

Bilateral Trade in Services data, at least at the 2-digit level described in the Extended Balance of Payments Services Classification (EBOPS 2010) should be provided

- Bilateral Trade in Services statistics should be made as coherent as possible with partner countries' reported bilateral trade in services. Where significant asymmetries exist, possible reasons should be highlighted, if known.
- Additional information should specify whether data follow the Sixth Edition of the Balance of Payments and International Investment Position Manual (BPM6) or BPM5.

All data should be consistent with published National Accounts at the time of their release. Any significant revisions made to the National Accounts but not to the SUTs or IOTs should be reported.

Annex 3 - Minimum requirements for inclusion in OECD ICIO Tables and TiVA database

It is important to note that while the minimum data requirements specified below will allow inclusion in the ICIO infrastructure, and hence the published TiVA database (subject to quality review), the more national statistics provided and the closer to the ideal requirements, the greater the quality of the TiVA indicators for the country in question.

SUTs or IOTs

The bare minimum for a country's integration into the ICIO infrastructure is the existence of at least two official national SUTs or IOTs

- Tables should be made available using the industry breakdown shown in Annex Table 1. Where this is not possible, every attempt must be made to ensure that industries (at the 2 digit level of ISIC) are not grouped together when at least one industry is a significant exporter (more than 5% of total exports).
- The latest tables must be for a relatively recent year (at least 2012).

National Accounts

In the absence of time series of SUTs (or IOTs), it is important to provide complete annual time series of National Accounts (SNA) main aggregates, preferably from 1995, to serve as aggregate constraints for estimating SUTs for the missing years. In particular, the following variables should be included (SNA codes in parentheses):

- Gross domestic product (B1_GE, B1_GA and B1_GI)
- Final consumption expenditure of general government (P3S13)
- Final consumption expenditure of households (P31S14)
- Final consumption expenditure of non-profit institutions serving households (P31S15)
- Gross fixed capital formation (P51)
- Changes in inventories and acquisitions less disposals of valuables (P52 and P53)
- Exports (P6), Exports of goods (P61)
- Imports (P7), Imports of goods (P71)
- Value added at basic prices (B1G)
- Taxes, less subsidies, on products (D21 and D31)
- Compensation of employees (D1)
- Gross operating surplus and gross mixed income (B2G and B3G)

In addition, SNA Value Added and Gross Output by industry (at basic prices), at the most detailed level possible, and for as many recent years as possible, should be provided to serve as constraints at the industry level.

Bilateral Merchandise trade in goods

Where detailed merchandise trade statistics (i.e. 6-digit HS) by partner countries have not been reported to the UN Comtrade database, e.g. for certain recent years, information on exports and imports of goods by major trading partners and by key products should be provided.

Balance of Payments

Annual time series of Trade in Services (TIS), preferably from 1995, should also be provided. In particular, the following breakdown (EBOPS code in parentheses):

- 1 Manufacturing services on physical inputs owned by others (SA)
- 2 Maintenance and repair services n.i.e (SB)
- 3 Transport (SC)
 - 3.1 Sea transport (SC1)
 - 3.2 Air transport (SC2)
 - 3.3 Other modes of transport (SC3)
 - 3.4 Postal and courier services (SC4)
- 4 Travel (SD)
 - 4.1 Travel Business (SDA)
 - 4.2 Travel Personal (SDB)
- 5 Construction (SE)
 - 5.1 Construction abroad (SE1)
 - 5.2 Construction in the reporting economy (SE2)
- 6 Insurance and pension services (SF)
- 7 Financial services (SG)
- 8 Charges for the use of intellectual property n.i.e. (SH)
 - 8.1 Franchises and trademarks licensing fees (SH1)
 - 8.2 Licences for the use of outcomes of research and development (SH2)
 - 8.3 Licences to reproduce and/or distribute computer software (SH3)
 - 8.4 Licences to reproduce and/or distribute audio-visual and related products (SH4)
- 9 Telecommunications, computer, and information services (SI)
 - 9.1 Telecommunications services (SI1)
 - 9.2 Computer services (SI2)
 - 9.3 Information services (SI3)
- 10 Other business services (SJ)
 - 10.1 Research and development services (SJ1)
 - 10.2 Professional and management consulting services (SJ2)
 - 10.3 Technical, trade-related and other business services (SJ3)
- 11 Personal, cultural, and recreational services (SK)
 - 11.1 Audio-visual and related services (SK1)
 - 11.2 Other personal, cultural, and recreational services (SK2)
- 12 Government goods and services n.i.e. (SL)

See

EBOPS

2010

manual:

https://unstats.un.org/unsd/publication/seriesm/seriesm_86rev1e.pdf