

THIS IS AN UPDATE TO THE TSDv8 database

The update now includes a consolidation of 2013-released OECD TiVA trade in services data, UNCTAD data, and EuroStat data, including reconstruction through mirror flows.

Consolidated Data on International Trade in Services v8.9

Joseph Francois

JOHANNES KEPLER UNIVERSITY (LINZ), AND CEPR

Olga Pindyuk

WIIW (VIENNA)

Abstract: This is an update to the 2009 release of the trade in services database (TSD). The database provides a consolidated and reconciled version of multiple sources of bilateral trade data. Its advantages over the original source data are that it provides broader coverage based on mirror flows, reconciliation of aggregate with underlying flows, and consolidation (allowing for broader coverage than offered by source data). One weakness, inherent in all available data of this type, is that even with mirror flows, a substantial share of South-South trade is unreported. As such, while we can recover North-South exports from mirror flows, we cannot recover all unreported bilateral flows. Comparing trade with the world can gauge the scale of the problem with bilateral flows in the database. This version includes extended EBOPS data in *.csv and *.dta (stata) format for the full database, as well as a smaller version aggregated to GTAP sectors. The panel spans 1981 to 2010, though early years and 2010 are relatively incomplete. Recent year data covers almost all OECD trade (based on reported totals and bilateral flows) though only 40 to 60 percent of middle and low-income bilateral flows can be identified.

1. INTRODUCTION

This document provides an overview of the updated Trade in Services database, version 8.7¹. The database provides a consolidated and reconciled version of multiple sources of bilateral trade data. Its advantages over the original source data are that it provides broader coverage based on mirror flows, reconciliation of aggregate with underlying flows, and consolidation (allowing for broader coverage than offered by source data). One weakness, inherent in all available data of this type, is that even with mirror flows, a substantial share of South-South trade is unreported. As such, while we can recover North-South exports from mirror flows, we cannot recover all unreported bilateral flows. The scale of the problem can be gauged by comparing trade with the world with bilateral flows in the database.

¹ Past versions of the Trade in Services database, on which this version builds, have benefitted from support from the European Commission, the World Bank, DFID, and Stichting IIDE.

Services have unique characteristics that greatly affect their tradability. The two most obvious characteristics include intangibility and non-storability, however typically they also require differentiation and joint production, with customers having to participate in the production process. In order to capture these aspects and to allow for trade in services that also require joint production, the WTO defines trade to span four modes of supply:

- Mode 1 – Cross-border: services supplied from the territory of one country into the territory of another.
- Mode 2 – Consumption abroad: services supplied in the territory of a nation to the consumers of another.
- Mode 3 – Commercial presence: services supplied through any type of business or professional establishment of one country in the territory of another (i.e., FDI).
- Mode 4 – Presence of natural persons: services supplied by nationals of a country in the territory of another.

Due to data limitations, only data on cross-border services trade in GATS modes 1 and 2 can be collected in the dataset as they are reported in official Balance of Payments statistics. Though these are also the categories needed for the purpose of constructing international supply and use tables one should be aware that FDI remains an important channel for foreign providers to supply services. About 60% of global FDI stock is in the service sector, with finance and trade being the most important sectors therein. Services are also traded through cross-border movement of persons. On the consumer side (GATS “mode 2” trade), this includes for example Germans and Irish going to Poland for dental work, as well as tourism. On the producer side (GATS “mode 4” trade) it includes the cross-border temporary movement of skilled labour, like accountants and software engineers who increasingly work across Europe. It also includes Polish construction workers relocating temporarily for jobs in the Netherlands and France.

It is important to note that trade through affiliates (Mode 3) also includes exports that pass through affiliates. Indeed given the nature of services trade and the role of FDI in the sector, the activities of affiliates will include a mix of cross-border and local activities.

2. DATA SOURCES AND COMPILATION

To create a data set covering bilateral services flows, data from the OECD, Eurostat, UN, and IMF data (the latter data are only on trade with the World as a partner) have been collected. OECD, Eurostat and UN provide data on bilateral services trade flows on dual breakdown, by partners and BOP codes. The most comprehensive coverage of reporting countries among the three sources is the UN, which provides data on 190 reporters. Eurostat and OECD provide data for a limited number of reporters: Eurostat covers 27 EU members plus Croatia, Iceland, Japan, Norway, Turkey, Switzerland, and USA; while OECD covers 28 countries (all the OECD members apart from Chile, Iceland, Israel, Slovenia, and Switzerland). (WTO data on services trade have not been included since they provide limited coverage of sectors and partners – the data are reported only for 3 sectors and for World as a partner.) Since the quality of existing services data is rather low as compared with merchandise trade statistics, the data have to be adjusted extensively to assure their consistency. This has involved cross-checking across multiple sources to identify inconsistencies and make corrections as needed.

Working with multiple sources makes it somewhat easier to identify problems in the data linked to human error. For example, there are clear cases where data were entered such that one source reports flows three orders of magnitude above the other two sources for the same flow. Based on examination data, comparisons across sources have been made to filter errors of this type, as well as other problems apparently linked to identifiable data entry errors. It is also clear in examining the data that UN sources have in many cases identified and cleaned up errors that remain in the EUROSTAT and OECD series. In other words, they have identified and corrected many of the errors, like scaling problems, which we can also spot in the data. To this end, we also employed mirror flows.

After making corrections to individual bilateral flows, a further cross-check is made for individual sectors versus reported aggregate flows. For situations where a value of an aggregate was lower than the sum of its parts (trade values for some sectors were lower than the sum of values of their subsectors, or trade with the World was lower than the sum of trade flows to individual partners) adjustments have therefore been made. In such cases we changed the value of an aggregate by the difference between its initial value and sum of its components.

Description of the database variables is provided in Table 1.

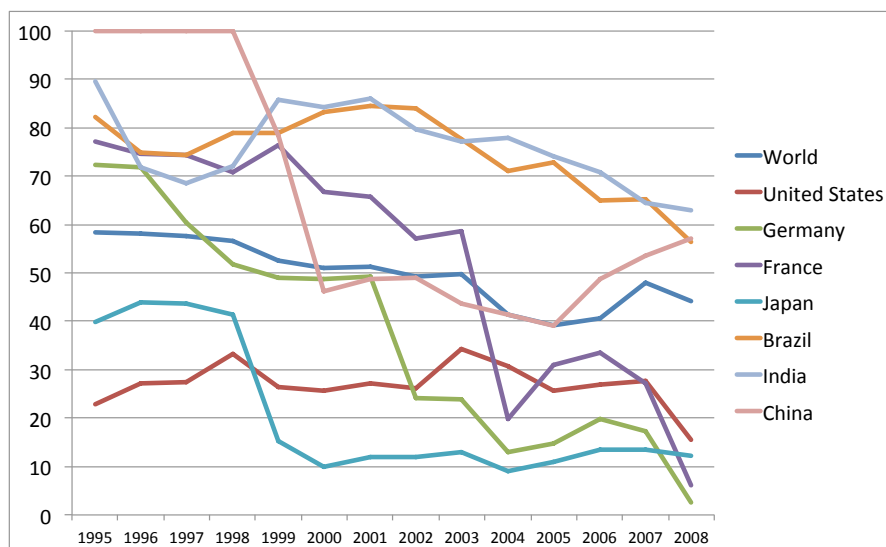
We have also mapped bilateral data on flows against data on total flows. This allows the addition of a region "XWD" which holds unallocated imports and exports for each country. With the addition of the XWD region, bilateral and aggregate data are internally consistent, including mappings from the aggregate to bilateral databases. The flows with the "XWD" follow from comparing total identified bilateral flows to reported total flows. Where the bilateral sums exceed reported totals, there is no "XWD" residual. This is usually the case if we have no reported totals, but only mirror bilateral flows. Often, there are unreported bilateral flows, so that total exports and imports with world imply unallocated flows. XWD is both an importer and exporter, so summing bilateral across partners gives total imports, and summing the flows over reporters gives total exports. In both cases these correspond to the "trade with world" values.

Coverage

The dataset contains data on bilateral services trade flows for the 248 countries as reporters and partners plus a rest of world. Additionally, data for each of the countries' trade with the world is available. Data are reported in million US \$ for 1981 – 2009. The coverage by BOP classification is presented in Table 2. The data include more than 20 economic activities according to the BOP classification. However, not all sectors have the same coverage in terms of time and trading countries. In general, the higher the level of disaggregation, the fewer observations are available.

As the graph below shows, reporting coverage has improved dramatically. As of 2008-2009, almost all OECD flows are now accounted for. By this we mean IMF totals with world and reported bilateral flows more or less match. However, for low and middle-income countries, we still find that 40 to 60 % of bilateral flows are unreported, while there are inconsistencies in terms of what is reported by these countries.

Commercial Services: Share of Unallocated Bilateral Trade



source: TSD database v8.7

As a word of caution it should be added that the quality of trade data in services is still far away from being comparable to trade data for merchandise goods. Due to the long tradition of tariff revenues, trade data for goods have been collected with quite high quality and accuracy. Due to intangibility and non-storability of services, at-the-border-duties cannot be applied to services, thus having resulted in much weaker compilation practices with considerable less accuracy. Thus, services statistics has ample space for improvement in terms of measurement. In particular with respect to modes 3 and 4, measurement is up to date difficult and incomplete. Ongoing revisions and refinements of the BOP classification work towards solving these issues. The Trade in Services Database should be seen in this light as the best currently available approximation to a comprehensive picture of global trade flows in services.

Table 1 – Description of the Database

| variable name | description |
|---------------|--|
| REP | ISO 3-digit code for reporting country |
| PAR | ISO 3-digit code for partner country |
| BOP | BOP Manual 5 3-digit code for service activity |
| YEAR | Year |
| VALUE | Services imports value, USD mln |
| NAME | Sector name |
| DESCRIPTION | Sector description |

Table 2 – Service sector classification by BOP categories

| |
|---|
| 200 Total EBOPS Services |
| 205 1 Transportation |
| 206 1.1 Sea transport |
| 207 1.1.1 Passenger |
| 208 1.1.2 Freight |
| 209 1.1.3 Other |
| 210 1.2 Air transport |
| 211 1.2.1 Passenger |
| 212 1.2.2 Freight |
| 213 1.2.3 Other |
| 214 1.3 Other transport |
| 215 1.3.1 Passenger |
| 216 1.3.2 Freight |
| 217 1.3.3 Other |
| 218 1.4 Space transport |
| 219 1.5 Rail transport |
| 220 1.5.1 Passenger |
| 221 1.5.2 Freight |
| 222 1.5.3 Other |
| 223 1.6 Road transport |
| 224 1.6.1 Passenger |
| 225 1.6.2 Freight |
| 226 1.6.3 Other |
| 227 1.7 Inland waterway transport |
| 228 1.7.1 Passenger |
| 229 1.7.2 Freight |
| 230 1.7.3 Other |
| 231 1.8 Pipeline transport and electricity transmission |
| 232 1.9 Other supporting and auxiliary transport services |
| 236 2 Travel |
| 237 2.1 Business travel |
| 238 2.1.1 Expenditure by seasonal and border workers |
| 239 2.1.2 Other |
| 240 2.2 Personal travel |
| 241 2.2.1 Health-related expenditures |
| 242 2.2.2 Education-related expenditures |
| 243 2.2.3 Other |
| 245 3 Communications services |
| 246 3.1 Postal and courier services |
| 247 3.2 Telecommunications services |
| 249 4 Construction services |
| 250 4.1 Construction abroad |
| 251 4.2 Construction in the compiling economy |
| 253 5 Insurance services |
| 254 5.1 Life insurance and pension funding |
| 255 5.2 Freight insurance |
| 256 5.3 Other direct insurance |
| 257 5.4 Reinsurance |
| 258 5.5 Auxiliary services |
| 260 6 Financial services |
| 262 7 Computer and information services |
| 263 7.1 Computer services |
| 264 7.2 Information services |

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- 266 8 Royalties and license fees
 - 268 9 Other business services
 - 269 9.1 Merchanting and other trade-related services
 - 270 9.1.1 Merchanting
 - 271 9.1.2 Other trade-related services
 - 272 9.2 Operational leasing services
 - 273 9.3 Miscellaneous business, , professional, and technical services
 - 274 9.3.1 Legal, accounting, management consulting, and public relations
 - 275 9.3.1.1 Legal services
 - 276 9.3.1.2 Accounting, auditing, bookkeeping, and tax consulting services
 - 277 9.3.1.3 Business and management
 - 278 9.3.2 Advertising, market research
 - 279 9.3.3 Research and development
 - 280 9.3.4 Architectural, engineering, and other technical services
 - 281 9.3.5 Agricultural, mining, and on-site processing services
 - 282 9.3.5.1 Waste treatment and depollution
 - 283 9.3.5.2 Agricultural, mining and other on-site processing services
 - 284 9.3.6 Other business services
 - 285 9.3.7 Services between related enterprises, n.i.e.
 - 287 10 Personal, cultural, and recreational services
 - 288 10.1 Audiovisual and related services
 - 289 10.2 Other personal, cultural, and recreational services
 - 291 11 Government services, n.i.e.
 - 292 11.1 Embassies and consulate
 - 293 11.2 Military units and agencies
 - 294 11.3 Other government services
 - 981 Other services, total
 - 982 Commercial services, total
 - 983 Services not allocated
-

Table 3: Country Coverage

| Country | ISO3 | Country | ISO3 |
|--------------------------|----------|-------------------------|----------|
| Afghanistan | AFG | Christmas Island | CXR |
| Albania | ALB | Cocos (Keeling) Islands | CCK |
| Algeria | DZA | Colombia | COL |
| American Samoa | ASM | Comoros | COM |
| Andorra | AND | Congo (Brazzaville) | COG |
| Angola | AGO | Congo (Kinshasa) | COD |
| Anguilla | AIA | Cook Islands | COK |
| Antarctica | ATA | Costa Rica | CRI |
| Antigua and Barbuda | ATG | Côte d'Ivoire | CIV |
| Argentina | ARG | Croatia | HRV |
| Armenia | ARM | Cuba | CUB |
| Aruba | ABW | Cyprus | CYP |
| Australia | AUS | Czech Republic | CZE, CSK |
| Austria | AUT | Denmark | DNK |
| Azerbaijan | AZE | Djibouti | DJI |
| Bahamas | BHS | Dominica | DMA |
| Bahrain | BHR | Dominican Republic | DOM |
| Bangladesh | BGD | Ecuador | ECU |
| Barbados | BRB | Egypt | EGY |
| Belarus | BLR | El Salvador | SLV |
| Belgium | BEL | Equatorial Guinea | GNQ |
| Belize | BLZ | Eritrea | ERI |
| Benelux | BLX | Estonia | EST |
| Benin | BEN | Ethiopia | ETH |
| Bermuda | BER | Falkland Islands | FLK |
| Bermuda | BMU | Faroe Islands | FRO |
| Bhutan | BTN | Fiji | FJI |
| Bolivia | BOL | Finland | FIN |
| Bosnia and Herzegovina | BIH | France | FRA |
| Botswana | BWA | French Guiana | GUF |
| Bouvet Island | BVT | French Polynesia | PYF |
| Brazil | BRA | French Southern Lands | ATF |
| British Indian Ocean | IOT | Gabon | GAB |
| Brunei Darussalam | BRN | Gambia | GMB |
| Bulgaria | BGR | Georgia | GEO |
| Burkina Faso | BFA | Germany | DEU |
| Burundi | BDI | Ghana | GHA |
| Cambodia | KHM | Gibraltar | GIB |
| Cameroon | CMR | Greece | GRC |
| Canada | CAN | Greenland | GRL |
| Cape Verde | CPV | Grenada | GRD |
| Cayman Islands | CYM | Guam | GUM |
| Central African Republic | CAF | Guatemala | GTM |
| Chad | TCD | Guinea | GIN |
| Chile | CHL, CIL | Guinea-Bissau | GNB |
| China | CHN | Guyana | GUY |

Table 3: Country coverage (continued)

| Country | ISO3 | Country | ISO3 |
|----------------------------|------|--------------------------|------|
| Haiti | HTI | Micronesia | FSM |
| Heard and McDonald Islands | HMD | Moldova | MDA |
| Honduras | HND | Mongolia | MNG |
| Hong Kong | HKG | Montenegro | MNE |
| Hungary | HUN | Montserrat | MSR |
| Iceland | ISL | Morocco | MAR |
| India | IND | Mozambique | MOZ |
| Indonesia | IDN | Myanmar | MMR |
| Iran | IRN | Namibia | NAM |
| Iraq | IRQ | Nauru | NRU |
| Ireland | IRL | Nepal | NPL |
| Isle of Man | IMN | Netherlands | NLD |
| Israel | ISR | Netherlands Antilles | ANT |
| Italy | ITA | New Caledonia | NCL |
| Jamaica | JAM | New Zealand | NZL |
| Japan | JPN | Nicaragua | NIC |
| Jordan | JOR | Niger | NER |
| Kazakhstan | KAZ | Nigeria | NGA |
| Kenya | KEN | Niue | NIU |
| Kiribati | KIR | Norfolk Island | NFK |
| Korea, North | PRK | Northern Mariana Islands | MNP |
| Korea, South | KOR | Norway | NOR |
| Kuwait | KWT | Oman | OMN |
| Kyrgyzstan | KGZ | Pakistan | PAK |
| Laos | LAO | Palau | PLW |
| Latvia | LVA | Palestine | PSE |
| Lebanon | LBN | Panama | PAN |
| Lesotho | LSO | Papua New Guinea | PNG |
| Liberia | LBR | Paraguay | PRY |
| Libya | LBY | Peru | PER |
| Liechtenstein | LIE | Philippines | PHL |
| Lithuania | LTU | Pitcairn | PCN |
| Luxembourg | LUX | Poland | POL |
| Macau | MAC | Portugal | PRT |
| Macedonia | MKD | Puerto Rico | PRI |
| Madagascar | MDG | Qatar | QAT |
| Malawi | MWI | Romania | ROU |
| Malaysia | MYS | Russian Federation | RUS |
| Maldives | MDV | Rwanda | RWA |
| Mali | MLI | Saint Helena | SHN |
| Malta | MLT | Saint Kitts and Nevis | KNA |
| Marshall Islands | MHL | Saint Lucia | LCA |
| Mauritania | MRT | Saint Vincent and the | VCT |
| Mauritius | MUS | Samoa | WSM |
| Mayotte | MYT | San Marino | SMR |
| Mexico | MEX | Sao Tome and Principe | STP |

Table 3: Country Coverage (continued)

| Country | ISO3 | Country | ISO3 |
|---|--------------------|---------------------------|------|
| Saudi Arabia | SAU | Virgin Islands, British | VGB |
| Senegal | SEN | Virgin Islands, U.S. | VIR |
| Serbia | SRB, SER, SCG, YUG | Wallis and Futuna Islands | WLF |
| Seychelles | SYC | West Bank and Gaza | WBG |
| Sierra Leone | SLE | Western Sahara | ESH |
| Singapore | SGP | World | WLD |
| Slovakia | SVK | World (residual) | XWD |
| Slovenia | SVN | Yemen | YEM |
| Solomon Islands | SLB | Zambia | ZMB |
| Somalia | SOM, ISM | Zimbabwe | ZWE |
| South Africa | ZAF | | |
| South Georgia and South Sandwich Islands | SGS | | |
| Spain | ESP | | |
| Sri Lanka | LKA | | |
| Sudan | SDN | | |
| Suriname | SUR | | |
| Swaziland | SWZ | | |
| Sweden | SWE | | |
| Switzerland | CHE | | |
| Syria | SYR | | |
| Taiwan | TWN | | |
| Tajikistan | TJK | | |
| Tanzania | TZA | | |
| Thailand | THA | | |
| Timor-Leste | TLS | | |
| Togo | TGO | | |
| Tokelau | TKL | | |
| Tonga | TON | | |
| Trinidad and Tobago | TTO | | |
| Tunisia | TUN | | |
| Turkey | TUR | | |
| Turkmenistan | TKM | | |
| Turks and Caicos Islands | TCA | | |
| Tuvalu | TUV | | |
| Uganda | UGA | | |
| Ukraine | UKR | | |
| United Arab Emirates | ARE | | |
| United Kingdom | GBR | | |
| United States Minor Outlying Islands | UMI | | |
| United States of America | USA | | |
| Uruguay | URY | | |
| Uzbekistan | UZB | | |
| Vanuatu | VUT | | |
| Vatican City | VAT | | |
| Venezuela | VEN | | |
| Vietnam | VNM | | |

Table 4: Database Contents

| name | format | description |
|-------------|--------------|-------------------------------------|
| REP | str8 %9s | ISO3 reporter (importer) |
| PAR | str8 %9s | ISO3 partner (exporter) |
| YEAR | float %8.0g | year of trade flow |
| BOP | float %8.0g | EBOBS classification/code |
| VALUE | float %15.3f | value of trade in million dollars |
| DESCRIPTION | str85 %85s | EBOBS description |
| NAME | str90 %90s | combined EBOBS code and description |

notes:

- values are in millions of current US dollars
- Because of the apparent mixing of zero and missing by source agencies, we have opted to use missing, or “.”, for reported zero and missing flows.
- total with world is the greater of reported total with world, or aggregate of bilateral flows
- region XWD holds difference between all bilateral flows and global (trade with world) total. It is the sum of flows with missing partners. This means XWD holds identified flows without a partner. It does not hold flows that are totally unreported.
- all unreported REP:PAR:BOP:YEAR combinations, meaning that do not even appear in the dataset, can be safely assumed to be missing. By this, we mean there is no reported source for these flows, and the countries-product-year combination does not even occur in any of the underlying source data.

Annex: Codebook Summary from STATA

REP ISO3 for importing country

type: string (str8), but longest is str3

unique values: 247 missing "": 0/7117775
 examples: "DEU"
 "IDN"
 "MEX"
 "SVK"

PAR ISO3 for exporting country

type: string (str8), but longest is str3

unique values: 250 missing "": 0/7117775
 examples: "DEU"
 "IDN"
 "MEX"
 "SVK"

YEAR Period

type: numeric (float)

range: [1981,2010] units: 1
 unique values: 30 missing .: 0/7117775
 mean: 1997.96
 std. dev: 7.55897

percentiles: 10% 25% 50% 75% 90%
 1987 1991 1998 2005 2008

BOP EBOPS Services Code

type: numeric (float)

range: [200,983] units: 1
 unique values: 110 missing .: 0/7117775
 mean: 333.403
 std. dev: 227.48

percentiles: 10% 25% 50% 75% 90%

211 226 255 281 891

VALUE millions of dollars

type: numeric (float)

range: [0,559749.69] units: 1.000e-20
 unique values: 411948 missing .: 4552044/7117775
 mean: 239.718
 std. dev: 3301.99

percentiles: 10% 25% 50% 75% 90%
 0 0 0 4.44236 92.6013

DESCRIPTION EBOPS DESCRIPTION

type: string (str85), but longest is str82

unique values: 105 missing "": 40/7117775
 examples: "1.6 Other transport of which: Road transport"
 "11.3 Other government services"
 "5.2 Freight insurance"
 "9.3 Miscellaneous business, professional, and
 technical services"

warning: variable has embedded blanks

NAME EBOPS and BOP sectoring

type: string (str90)

unique values: 105 missing "": 40/7117775
 examples: "EBOPS: 221 1.5.2 Freight"
 "EBOPS: 243 2.2.3 Other"
 "EBOPS: 268 9 Other business services"
 "EBOPS: 287 10 Personal, cultural, and recreational
 services"

warning: variable has embedded blanks