

B Services Trade Data

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B.1 Introduction

Prior to GTAP 11, trade in services data was based on unilateral services trade information from the IMF, which we had to bilateralize in-house (McDougall 2002; McDougall and Hagemeyer 2006; Lejour, Leeuwen, and McDougall 2010). This data was bilateralized using the RAS method in versions 3, 4 and 5, then improved by using additional sources such as OECD and Eurostat, versions 6 to 10.

Since GTAP 11, we take advantage of Balanced Trade in Services, or BaTiS, (Liberatore and Wettstein 2021), developed by the OECD and WTO, which provides bilateralized trade flows that do not need to be reconciled. The starting point for BaTiS is the trade in services dataset developed jointly by the WTO and the United Nations Conference on Trade and Development (WTO-UNCTAD).

B.2 Data Sources

BaTiS provides time series data from 2005 to 2023 covering over 200 economies and the services sectors are classified into 12 service categories based on the 2010 extended balance of payments services, EBOPS, classification (Liberatore and Wettstein 2021), see Table 10.1.

Table 10.1: Balanced Trade in Services (BaTiS) Classification

No.	Code	Description	GTAP sector code
1	SA	Manufacturing services on physical inputs owned by others	n/a
2	SB	Maintenance and repair services n.i.e.	trd
3	SC	Transport	atp, wtp, otp, whs, cmn
4	SD	Travel	trvl, hht, edu, afs
5	SE	Construction	cns
6	SF	Insurance and pension services	ins
7	SG	Financial services	ofi
8	SH	Charges for the use of intellectual property n.i.e.	n/a
9	SI	Telecommunications, computer, and information services	cmn
10	SJ	Other business services	obs, trd, rsa
11	SK	Personal, cultural, and recreational services	cmn, hht, edu, ros
12	SL	Government goods and services n.i.e.	osg

n.i.e. Not included elsewhere; n/a is not available;

trvl is not a sector in GTAP, but is a code assigned for the special treatment of traveler's expenditures.

Some of the sectors in BaTiS correlate well to GTAP services sectors, others are too aggregated for GTAP. In order to disaggregate the sectors in BaTiS, we use another recently developed

dataset that focuses on the trade of services. This is called the Trade in Service data by Mode of Supply, TiSMoS, which provides more detailed information, but is not bilateral (Wettstein et al. 2021). TiSMoS is a dataset produced by the WTO and funded by the Directorate General for Trade of the European Commission (Wettstein et al. 2021).¹

TiSMoS also uses the WTO-UNCTAD-ITC data set as a starting point for the measurement of resident to nonresident transactions. It is developed with the objective of providing another analytical dimension to the information available to the public, namely, the mode of supply dimension. As such, one of the dimensions of TiSMoS consists of the four modes of supply per the definition of the General Agreement on Trade in Services (GATS): cross-border supply (mode 1), consumption abroad (mode 2), commercial presence (mode 3), and presence of natural persons (mode 4) for 200 countries or regions during the 2005-2022 period. Furthermore, the sectoral coverage of TiSMoS is very detailed; it covers 55 sectors similar to the extended balance of payments services (EBOPS).

For GTAP's reference year we use BaTiS earliest reference year (i.e., 2005) for all but two countries (i.e., Serbia and Montenegro for which we use 2006). We apply GDP weights to obtain an estimate for 2004.

B.3 Procedures

Using bilateral balanced data is convenient; however, the sectoral coverage does not match perfectly with the GTAP 20 services sector. There are 4 services sectors that are not covered by BaTiS: electricity (ely), gas distribution (gdt), water supply (wtr), and ownership of dwellings (dwe). As in previous versions, for these and other energy sectors, including electricity and gas distribution, energy trade data are constructed using data from the International Energy Agency (IEA) as documented in Chepeliev 2022. The two remaining sectors (e.g., wtr, dwe) are assumed not to be traded.

In addition, there are two sectors provided in BaTiS that we do not consider: manufacturing services on physical inputs owned by others (SA) and the charges for the use of intellectual property n.i.e. (SH). For the latter (SH), we follow a previous treatment that considers royalties to be an income flow rather than a trade flow. As such, this information is discarded because it is considered a factor payment (McDougall and Hagemeyer 2006). For the former, this is also discarded because it is not clear which manufacturing sectors are involved. We note that SA or the manufacturing services on physical inputs owned by others is defined as follows:

Covering the processing, assembly, labeling, packing, and other such processes undertaken by enterprises that do not own the physical inputs concerned.

Only the fee (the manufacturing service) charged by the enterprise undertaking the manufacturing service is included under this item.

¹ Another possible data source is the International Trade in Services Statistics by the OECD, which is bilateral but with emphasis on OECD member countries.

But the breakdown by type of manufacturing services (i.e., whether it is assembly or packaging), is unknown, as well as the economic sectors from which it originates (i.e., motor vehicles or machinery).

The disaggregation of the remaining BaTiS sectors using TiSMoS considers the sum of all modes, except Mode 3. Table 10.2 lists the BaTiS sectors that are disaggregated using TiSMoS. Table 10.2 also includes the concordance between the disaggregated sector and GTAP. As there is no clear identification of warehouse services we assign 20% of other transport (from sea, air and other) with the remaining is assigned to

Traveler expenditures (trvl) are not distinguished as a sector in GTAP, but are accounted for. As in previous versions, traveler's expenditures are allocated as trade among countries using information about private consumption (McDougall and Hagemeyer 2006). This is a simplifying assumption due to the lack of better data and the reason why the GTAP Data Base may sometimes report trade in water supply or electricity between distant countries.

Table 10.2: BaTiS sectors subject to disaggregation using TiSMoS

Code	BaTiS	Code	TiSMoS	GTAP
SC	Transport	SC11, SC12	Sea transport (passenger and freight)	wtp
		SC21, SC22	Air transport (passenger and freight)	atp
		SC31, SC32	Other transport (passenger and freight)	otp
		SC13, SC23, SC33	Transport, Other	whs
		SC4	Postal and courier services	cmn
SD	Travel	SDA	Business travel	trvl*
		SDB1	Health-related travel	hht
		SDB2	Education-related travel	edu
		SDB3	Other personal travel	afs
SJ	Other business services	SJ1	Research and development services	obs
		SJ2	Professional and management consulting	obs
		SJ31	Architectural and engineering services	obs
		SJ32	Waste treatment and de-pollution, agricultural and mining services	obs
		SJ33	Operating leasing services	rsa
		SJ34	Trade-related services	trd
		SJ35	Other business services n.i.e.	obs
SK	Personal, cultural, and recreational services	SK1	Audio-visual and related services	cmn
		SK21	Health services (personal)	hht
		SK22	Education services (personal)	edu
		SK23	Heritage and recreational services	ros
		SK24	Other personal services	ros

* trvl is not a sector in GTAP, but is a code assigned for the special treatment of traveler's expenditures.

B.4 Trade in Mode of Supply

In this section we present a new data satellite based on the TiSMoS data. This satellite is simply an aggregation of the original TiSMoS data to reflect the GTAP classification of sectors and regions. The file name is 'gsdftismos.har' and it contains 2 data headers for the value of imports (VIMP) and the value of exports (VEXP) both in millions of current USD.

There are 4 additional headers that reflect the dimensions or sets consistent with the data headers. These sets include the years, from 2005 to 2022, and the 4 modes of supply, in addition to GTAP regions and services sectors. As before, we do not report the 4 services sectors for which trade data is not available. Also, while BaTiS reports data for public administration trade which is directly mapped to GTAP's osg sector, this is not reported by TiSMoS. When placed in the folder of the data aggregation utilities, it will be aggregated according to the country aggregation specification.

References

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