Bilateral Services Trade Data in the GTAP-7 database

Nico van Leeuwen
Robert McDougall
Structure forum

- Services Trade data in GTAP
- Bilateral services trade data OECD
- CPB methodology and results
- What can CPB do for GTAP-8 database?
- Build in GTAP database
- Opportunities
Services trade data in GTAP

- Non-margin services (basically this presentation)
  - Around 12% of total world trade in 2004
- Margin services usage
  - International freight transport (usage)
- Margin services supply
  - International freight transport (supply)
- Travelers expenditure
  - Consumption abroad (around 6%)

Documented in chapter 9.D of GTAP-7 documentation (forthcoming)
GTAP trade data on services in the past

- Bilateral trade flows not based on observations
- 11 sectors for non-margin flows
- Export of margins in transport sectors
- All GTAP countries / regions
- Sources: IMF balance of payments statistics and CGTA (McCougall & Hagemejer)
- RAS procedure to rebalance exports and imports,
  - based on bilateral commodity trade flows
Why improve non margins services?

- Services markets with new policies
  - GATS (1995)
  - DOHA rounds: open services markets
  - EU: services directives (2004)
  - general equilibrium analysis

- GTAP <=6, bilateral data constructed

- New: bilateral services trade from OECD/ Eurostat by (some) sector(s)
  - Statistics of International Trade in Services: Detailed Tables by Partner Country (including unpublished data)

- Contributed to GTAP7 database
  - published in 2008
Bilateral flows from 29 reporters and many partner countries
covers more than 70% cross-border of world exports and imports of services in 2004
Both for exports and imports
Four sectors publicly available
plus break out of commercial services into 8 sub sectors
Using IMF with information from country experts and EUROSTAT
# OECD – GTAP concordance

<table>
<thead>
<tr>
<th>OECD codes and names</th>
<th>GTAP codes and names</th>
</tr>
</thead>
<tbody>
<tr>
<td>200: TOTAL SERVICES</td>
<td>TOT total services</td>
</tr>
<tr>
<td>205: TRANSPORTATION</td>
<td>TRA transport</td>
</tr>
<tr>
<td>236: TRAVEL</td>
<td>TRV Travel</td>
</tr>
<tr>
<td>245: COMMUNICATION SERVICES</td>
<td>CMN communication</td>
</tr>
<tr>
<td>249: CONSTRUCTION SERVICES</td>
<td>CNS construction</td>
</tr>
<tr>
<td>253: INSURANCE SERVICES</td>
<td>ISR insurance</td>
</tr>
<tr>
<td>260: FINANCIAL SERVICES</td>
<td>OFI financial services nec</td>
</tr>
<tr>
<td>262: COMPUTER AND INF.SERVICES</td>
<td>CIS Computer and inf. serv. (OBS)</td>
</tr>
<tr>
<td>266: ROYALTIES AND LICENSE FEES</td>
<td>RLF ROYALTIES AND LICENSE FEES</td>
</tr>
<tr>
<td>268: OTHER BUSINESS SERVICES</td>
<td>OBC business services nec (OBS)</td>
</tr>
<tr>
<td>287: PERSONAL, CULT. AND RECR. SERVICES</td>
<td>ROS recreational and other services</td>
</tr>
<tr>
<td>291: GOVERNMENT SERVICES, N.I.E.</td>
<td>OSG public admin. and defence, education, health</td>
</tr>
<tr>
<td>984a: OTHER COMMERCIAL SERVICES</td>
<td>OCS other comm. services</td>
</tr>
</tbody>
</table>
Availability of the OECD data(1)

transportation

- export + imports
- export + missing
- missing + import
- missing + missing

1999 2000 2001 2002 2003 2004
Availability of the OECD data(2)

financial services nec

- Export + imports
- Export + missing
- Missing + import
- Missing + missing

1999 2000 2001 2002 2003 2004
Gathering data reported exports and imports

Determine most reliable reporter for two mirror flows: Gehlhar method

- reliability indices by sector and reporting country (1999-2004)
- reliable if value of reporting countries deviates less than 20%
- highest index between reporting flows determines value
- if country reports NA for a year, contribution is zero

If one observation per flow: that observation
If no observation for a flow: estimation
If observation < zero: then zero
Reliability indices (in %), average over all countries, 1999-2004

- TTT
- TRA
- TRV
- CMN
- CNS
- ISR
- OFI
- CIS
- RLF
- OBC
- ROS
- OSG
- OCS

- Black: Reporting exporter
- Gray: Reporting importer
Comparing results(1):
other commercial services in 2002

Flows from France to

<table>
<thead>
<tr>
<th>BLN US$</th>
<th>Germany</th>
<th>Italy</th>
<th>United Kingdom</th>
</tr>
</thead>
<tbody>
<tr>
<td>reported export</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>reported import</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>result</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Legend:
- Black: Germany
- Gray: Italy
- Light Gray: United Kingdom
Comparing results(2):
other commercial services in 2002

Flows from Germany to

<table>
<thead>
<tr>
<th>Country</th>
<th>Reported Export</th>
<th>Reported Import</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>5</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Italy</td>
<td>2</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>1</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>
Comparing results(3):
other commercial services in 2002

Flows from Italy to

BLN US$

reported export
reported import
result

France  Germany  United Kingdom
Comparing results(4):
other commercial services in 2002

Flows from United Kingdom to

- Reported export
- Reported import
- Result

BLN US$

France  Germany  Italy
Final results from CPB

- 12 matrices of each OECD sector
  - include non published ones.
- Includes countries and regions
  - OECD 27 by 27, EU15, HKG and RUS, (incl. estimations)
  - Other OECD and partner countries only available data, also using aggregates
- CPB memorandum incl. data:
What next?

- Create new service trade flows for GTAP-8 database
- Use new source
- United Nations Service Trade Statistics Database
- More countries: 8 EU27 non-OECD members, Other countries (HRV, TUN and UKR)
- Hopefully less missing data….
IMF Balance of Payments Statistics

- 166 countries
- more than adequate commodity detail
- incomplete
- not necessarily updated
- false zeros
- well balanced within countries
- unbalanced globally
- totals per country differ between OECD and IMF
comparing exports of IMF with OECD (%)

Belgium  Denmark  France  Germany  United Kingdom  Italy  Netherlands  Spain

TRA  OFI
Services Trade Pre-Processing

- Clean IMF unilateral estimates.
- Construct IMF-based bilateral trade estimates.
- Balance CPB estimates against IMF-based.
- Overwrite IMF-based with CPB-based estimates.
IMF-Based and CPB Bilateral

- Construct bilateral estimates from IMF data:
  - Pro-rate.
  - Zero out diagonal.
  - Rebalance.
- For each of the 29 CPB countries, from the IMF-based estimates, calculate total exports and imports of each commodity to the other 28.
- Balance the CPB estimates against those totals.
Incorporating Bilateral Data: Selected Effects

<table>
<thead>
<tr>
<th>Origin</th>
<th>Destn</th>
<th>Service</th>
<th>Before</th>
<th>After</th>
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<tbody>
<tr>
<td>usa</td>
<td>deu</td>
<td>obs</td>
<td>7406</td>
<td>293</td>
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<tr>
<td>mex</td>
<td>usa</td>
<td>trv</td>
<td>1212</td>
<td>5847</td>
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<tr>
<td>can</td>
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<td>trv</td>
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<td>7008</td>
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<tr>
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<tr>
<td>usa</td>
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<td>obs</td>
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<td>220</td>
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<tr>
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<td>jpn</td>
<td>trv</td>
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<td>14909</td>
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<td>usa</td>
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<td>1904</td>
<td>6729</td>
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<tr>
<td>aut</td>
<td>deu</td>
<td>obs</td>
<td>1787</td>
<td>6477</td>
</tr>
</tbody>
</table>

obs: other business services
trv: travelers' expenditures
Incorporating Bilateral Data: Description of Effects

- less trade between Europe and the USA
- more between the United States and its neighbors
- more between the United States and Japan
- more between Turkey and its neighbors
- more within Europe
- more between Japan and its neighbors
- less between Europe and Japan
## Shares in 29-29-Country Trade

<table>
<thead>
<tr>
<th>Service Type</th>
<th>CPB</th>
<th>IMF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government services</td>
<td>1.9</td>
<td>2.7</td>
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<tr>
<td>Construction</td>
<td>1.3</td>
<td>1.9</td>
</tr>
<tr>
<td>Computer, IT</td>
<td>3.8</td>
<td>3.1</td>
</tr>
<tr>
<td>Personal, recreational</td>
<td>1.3</td>
<td>1.6</td>
</tr>
<tr>
<td>Insurance</td>
<td>3.2</td>
<td>3.6</td>
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</table>
# Shares in 29-29-Country Travelers' Expenditures Exports

<table>
<thead>
<tr>
<th>Country</th>
<th>CPB</th>
<th>IMF</th>
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<tbody>
<tr>
<td>MEX</td>
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<td>2.0</td>
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<tr>
<td>USA</td>
<td>17.2</td>
<td>20.5</td>
</tr>
<tr>
<td>HKG</td>
<td>1.2</td>
<td>2.1</td>
</tr>
<tr>
<td>DNK</td>
<td>1.4</td>
<td>0.8</td>
</tr>
<tr>
<td>JPN</td>
<td>2.0</td>
<td>2.6</td>
</tr>
<tr>
<td>TUR</td>
<td>2.8</td>
<td>3.5</td>
</tr>
<tr>
<td>AUS</td>
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<td>3.4</td>
</tr>
<tr>
<td>DEU</td>
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<td>6.1</td>
</tr>
<tr>
<td>AUT</td>
<td>4.2</td>
<td>3.4</td>
</tr>
</tbody>
</table>
Opportunities

- IMF data cleaning: false zeros
- Construction of IMF-based bilateral trade data: take merchandise trade as template?
- Modal shares
- Commodity composition of travelers' expenditure