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SEASONALLY ADJUSTING EXTERNAL TRADE SERIES: THE "SATIE" PROJECT

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SEASONALLY ADJUSTING EXTERNAL TRADE SERIES: THE “SATIE” PROJECT

1. EXTERNAL TRADE SERIES

- *A huge number of monthly series:*
 - 15 + 12 = 27 reporting countries (Member-States + Candidate Countries)
 - more than 200 partner countries
 - more than 12 000 products that can be aggregated over 10 different nomenclatures
 - 3 flows: imports, exports, and balance

- *Strong additivity constraints for the gross data:*
 - Reporting countries (ex: EU15 = \sum Member States)
 - Partners (ex: North America = USA + Canada)
 - Products (ex: HS 1digit = \sum HS 2digits)
 - Flows: Balance = Exports - Imports

- *Special EU regulation to ensure the reporter-additivity of trade*
Ex: France/USA trade + NL/USA trade = (France + NL)/USA trade

2. HANDLING DIFFERENT USER NEEDS: Relex & Trade

1. *Many SA series for EMU12 and EU15 with a breakdown by partner and product:*
(Designed for DG Relex, Trade interested in the EU as a whole)
 - 2 reporting zones (MU12 and EU15)
 - 30 partner countries + aggregates
 - 10 products + aggregates
 - 2 flows + balance

The direct approach is used for MU12 and EU15:

(the indirect approach would require to handle 15×more series which would be not feasible)

(the additivity problem is not visible as no series by Member-State are proposed)

The indirect approach is used for product and partner aggregates:

(Ex: Extra-EU15 = Extra-M12 + Sweden + Austria + Finland)

The indirect approach is used for the flows:

(Balance = Exports - Imports)

HANDLING DIFFERENT USER NEEDS: ECB, Ecfm&Markt

2. Few critical series with a breakdown by reporter

(Designed for DG Markt, Ecfm interested in the convergence within EU/EMU)

- 15 reporting zones (15 Member-States + EMU12 + EU15)
- 4 partner zones (Intra/Extra EMU12 and Intra/Extra EU15)
- Total products
- 2 flows + balance

The indirect (centralised) approach is used for MU12 and EU15

(the indirect approach is feasible as there is only a small number of series)

(the additivity must be guaranteed as series by Member-State are proposed)

The direct approach is used for partner aggregates

(there is no breakdown by partner aggregate)

The indirect approach is used for the flows

(Balance = Exports - Imports)

3. THE INDIRECT APPROACH: Problems

1. Technical problems

- A larger number of series to handle
- Very detailed series may be unstable as compared to the aggregated ones:
It is generally not the case as we seasonally adjust very aggregated series except for Luxembourg.

2. Political problems

- Political problems when the indirect approach is used for reporters (Member-States) in a centralised way
Eurostat/C4 makes the Working Day / Seasonal Adjustment of Member-States series (centralised approach) and then aggregate the results to build EMU and EU totals (indirect method). This allows to meet the ECB requirements of timeliness and quality as one single method (Tramo/Seats) and software (Demetra) is used for all series.

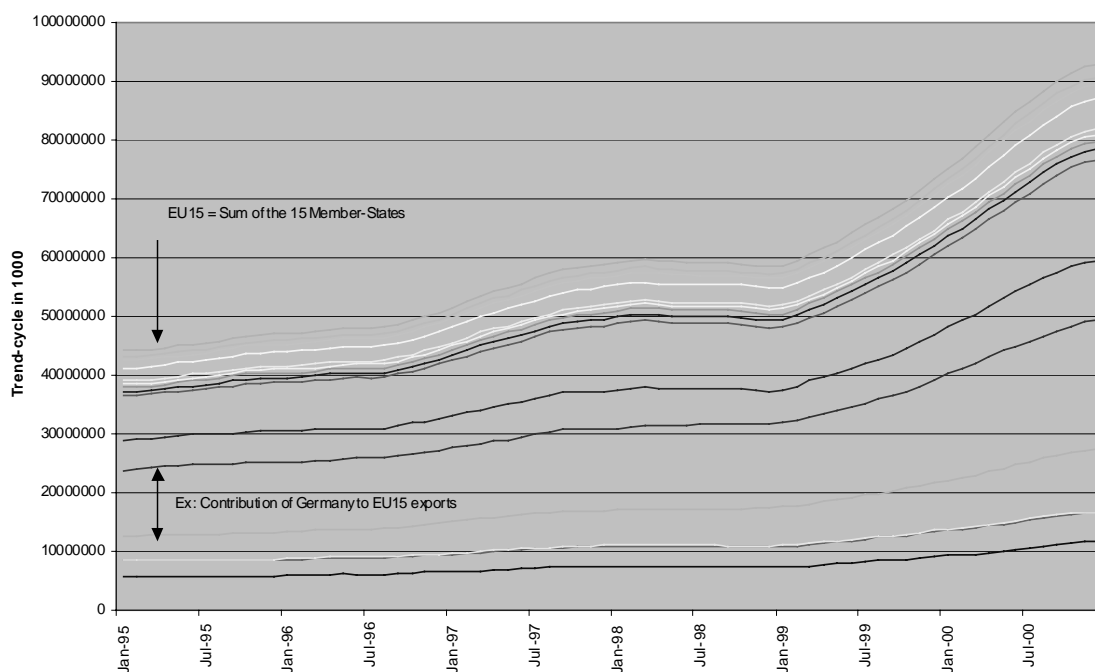
- Eurostat SA series differ from Member-States SA series

THE INDIRECT APPROACH: Political agreement

3. The conclusion of the External Trade Committee (June 2001)

- For Member-States that publish, at the national level, trade series according to a national concept that differs from the EU-concept series sent to Eurostat.
 - Eurostat is allowed to make the working day correction / seasonal adjustment of the most important trade series by Member-State and publish them. Eurostat may use in its models, the calendar effects identified by the Member-State concerned.
- For Member-States that publish, at the national level, trade series according to the same concept as for the series sent to Eurostat.
 - Eurostat is allowed to make the working day correction / seasonal adjustment of the most important trade series by Member-State and publish them. However, Eurostat will use, if technically possible, the model identified by the Member-State concerned (calendar effects included).
 - This solution still raises a problem as long as the Member-State concerned use trade series in national currencies and not in Euros (different stochastic behaviour).

THE INDIRECT APPROACH: Graphs

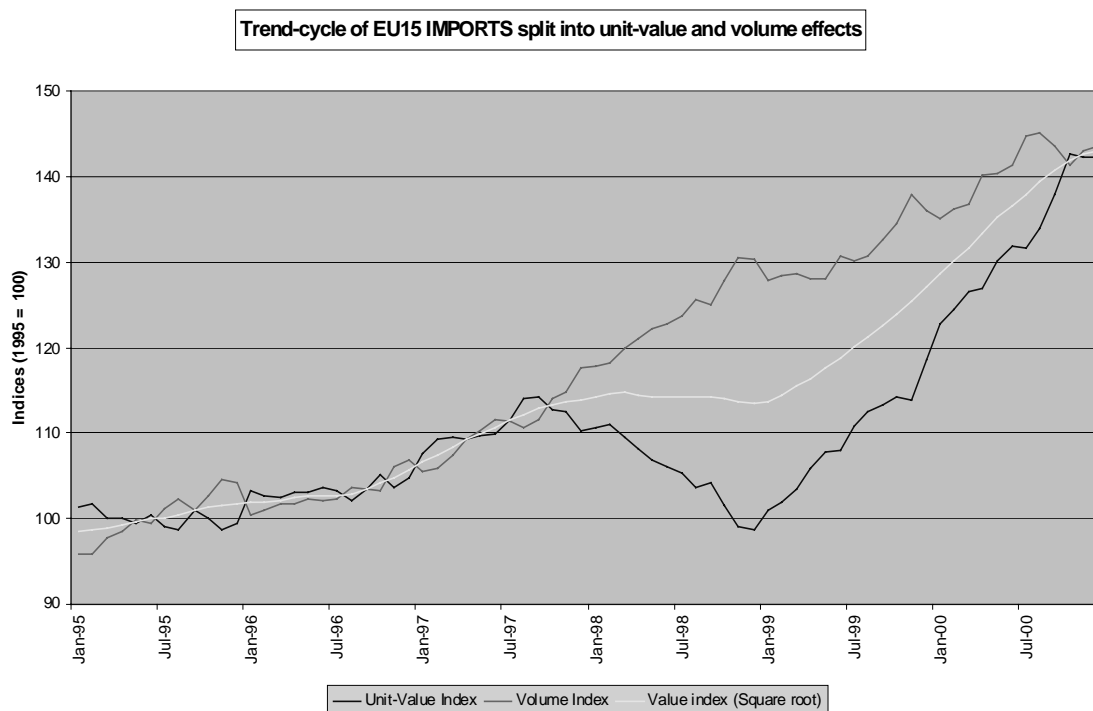


4. SEASONALLY-ADJUSTING VOLUME INDICES: “Satie”

Many users of external trade data are interested in the split between price and volume effects.

- For the time being, Eurostat estimates trade prices by unit-value indices that show no clear seasonal pattern ;
 - On the contrary, the volume indices defined as: $\text{value index} / \text{unit-value index}$ are very seasonal.
- The SATIE project = “Seasonal Adjustment, Trends and Indices for the External trade” has been developed to publish seasonally-adjusted and trended volume indices consistent with SA, trended trade values and unit-value indices. The following variables are now published monthly in Newcronos/Theme 6/Satie tables:
- Monthly trade value (gross)
 - Monthly trade value (seasonally-adjusted)
 - Monthly trade value (trend-cycle)
 - Monthly unit-value index (gross)
 - Monthly volume index (gross)
 - Monthly volume index (seasonally adjusted)
 - Monthly volume index (trend-cycle)

SEASONALLY-ADJUSTING VOLUME INDICES: “Graphs”



ANNEX I: Seasonal Adjustment Methods and Results

- 1422 series are seasonally adjusted each month whereas 2136 additional series are derived by aggregation (ex: balance = exports-imports).
- The seasonal adjustment is performed by using the DEMETRA 2.0 software developed by Eurostat.
- The Tramo/Seats method (Maravall/Gomez) is used for all series with the following results :
 - a fitting model has been found for all the 1422 series except the 10 following ones :
 - Luxembourg/EU3/Export/BEC Capital goods
 - Luxembourg/EU3/Export/BEC Consumption goods
 - EMU12/Greece/Import/SITC 3 (Mineral fuels)
 - EMU12/China/Exports/SITC 1 (Beverages & Tobacco ...)
 - EMU12/Oceania/Export/SITC 3
 - EU15/China/Import/SITC 4 (Animal and vegetable oils ...)
 - EU15/Accession countries/Import/SITC 1
 - EU15/China/Export/SITC 3
 - EU15/China/Export/SITC 3
 - EU15/Oceania/Export/SITC 3

Seasonal Adjustment Methods and Results

- The following statistics have been derived from a set of 450 seasonally-adjusted trade series (Member-States as reporters/Imports and Exports /BEC aggregates) :
 - 98 % of the series are seasonal
 - 96 % of the series need a log-transformation
 - A Working Day adjustment (2 regressors) is suitable for 77%, a Trading Day adjustment (7 regressors) for 5% and No Adjustment for 18%
 - Easter effect is significant for 25 % of the series
 - The ARIMA model was the airline model: (0,1,1) (0,1,1) in 62% of the cases whereas (2,1,0)(0,1,1) was chosen for 11%; (0,1,2) (0,1,1) and (3,0,0) (0,1,1) in 3% of the cases each.

ANNEX II: Satie series (Newcronos/Theme 6)

Reporter	Partner	Flow	Commodities
EMU12	United Kingdom Denmark Greece Norway Sweden Switzerland Russia United States Canada China Japan OPEC ASEAN Latin America ACCESSION NAFTA CIS EUROPE - EUR15 AFRICA AMERICA ASIA OCEANIA_Polar. EUROPE-UEM12 Intra-UEM12 Extra-UEM12 Extra-EUR15	Imports Exports <i>Balance</i> (= 2-1 ou 2/1)	Food and live animals chiefly for food (SITC 0) Beverages and tobacco (SITC 1) Crude materials, inedible, except fuels (SITC 2) Mineral fuels, lubricants and related materials (SITC 3) Animal and vegetable oils, fats and waxes (SITC 4) Chemicals and related products, n.e.s. (SITC 5) Manufactured goods classified chiefly by material (SITC 6) Machinery and transport equipment (SITC 7) Miscellaneous manufactured articles (SITC 8) Total trade incl. adj. data (SITC Total) Goods n.e.s (used for total trade only) (TTT-0-1-2-3-4-5-6-7-8) Food Drinks and Tobacco (0+1) Raw materials (2+4) Other Manufactured Products (6+8) Manufactured Products (5 to 8) Capital goods (BEC) Consumer goods (BEC) Consumption goods (BEC) Intermediate goods (BEC)

Satie series (Newcronos/Theme 6)

Reporter	Partner	Flow	Commodities
<p>EU5</p>	<p>Norway Switzerland Turkey Russia United States Canada China Japan ACP Med. Basin OPEC ASEAN Latin America CEEC (without Russia) ACCESSION NAFTA DAE CIS EUROPE - EUR15 AFRICA AMERICA ASIA OCEANIA_Polar Intra-EUR15 Extra-EUR15</p>	<p>Imports Exports <i>Balance</i> (= 2-1 ou 2/1)</p>	<p>Food and live animals chiefly for food (SITC 0) Beverages and tobacco (SITC 1) Crude materials, inedible, except fuels (SITC 2) Mineral fuels, lubricants and related materials (SITC 3) Animal and vegetable oils, fats and waxes (SITC 4) Chemicals and related products, n.e.s. (SITC 5) Manufactured goods classified chiefly by material (SITC 6) Machinery and transport equipment (SITC 7) Miscellaneous manufactured articles (SITC 8) Total trade incl. adj. data (SITC Total)</p> <p>Goods n.e.s (used for total trade only) (TTT-0-1-2-3-4-5-6-7-8)</p> <p>Food Drinks and Tobacco (0+1) Raw materials (2+4) Other Manufactured Products (6+8) Manufactured Products (5 to 8)</p> <p>Capital goods (BEC)</p> <p>Consumer goods (BEC)</p> <p>Consumption goods (BEC)</p> <p>Intermediate goods (BEC)</p>

Satie series (Newcronos/Theme 6)

Reporter	Partner	Flow	Commodities
France Netherlands Germany Italy United-Kingdom Ireland Denmark Greece Portugal Spain Belgique Luxembourg Sweden Finland Austria	Intra-UEM12 Extra-UEM12 Intra-EUR15 Extra-EUR15 EUR3 (SW+UK+DK)	Imports Exports Balance (= 2-1 ou 2/1)	Total Products Capital goods (BEC) Consumer goods (BEC) Consumption goods (BEC) Intermediate goods (BEC)