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Freight transport and insurance

This document has been written within component 1.2 of the twinning project between Geostat and Statistics Denmark. It describes the potential difficulties, which compilers of International Trade in Services Statistics (ITSS) and Balance of Payments (BoP) should be aware of when combining survey data on freight transport and insurance with traditional cif-fob corrections.

### Basic concepts

Import and export of goods are recorded in International Merchandise Trade Statistics (IMTS) as well as in the goods account of BoP. CIF and FOB are used to designate the value of these goods at certain points in time. FOB (Free On Board) designates the value of a good at the border of the exporting country, while CIF (Cost, Insurance and Freight) designates the value at the border of the importing country. The difference in the value equals the value of insurance and freight from the border of the exporting country to the border of the importing country.

### Delivery terms

In real life, traders may agree on different delivery terms, which will define the amount which is actually invoiced between the traders. For instance, the traders may agree that goods are delivered on the border of the exporting country (FOB type delivery terms) and consequently the seller will invoice the buyer for the goods at FOB value and the buyer will purchase transport and insurance from the border of the exporting country separately. Alternatively, the traders may agree that goods are delivered at the border of the importing country (CIF type delivery terms) and consequently the seller will invoice the CIF value. In that case, freight and insurance beyond the border of the exporting country will be purchased by the seller.

### Valuation of goods in IMTS and BoP

In IMTS and BoP, goods are valued uniformly, i.e. independently of the actual delivery terms and the invoiced amount. In IMTS, imports are valued at CIF and exports are valued at FOB. In contrast, BoP records the FOB value for both imports and exports.

Consider as an example the following movements of goods:

*Import to country A from country B, CIF type delivery terms:*

Country A Country B

CIF: 55 ← FOB: 50

*Export from country A to country B, CIF type delivery terms:*

Country A Country B

FOB: 100 → CIF: 120

IMTS of country A will show:

Import: 55 (invoiced amount: 55)

Export: 100 (invoiced amount: 120)

BoP of country A will show:

Import: 50 (invoiced amount: 55)

Export: 100 (invoiced amount: 120)

### Recording of freight and insurance in BoP and ITSS

Parallel to the valuation of goods at FOB value, BoP uniformly records freight and insurance costs beyond the border of the exporting country as incurred by the importer, irrespectively of the delivery terms and the actual payments.

In the examples above, delivery terms are CIF type, meaning that the seller will purchase transport and insurance beyond the border of the exporting country and include the amount in the invoice for the goods. However, in BoP, the purchase of freight transport and insurance will be assigned to the buyer of the goods and shown as service import in case the suppliers of transport and insurance are non-resident of the importing economy. As a result of this treatment, the sum of goods trade and service trade will equal the actual net payment between the countries. Adding service trade to the examples above, and assuming that transport and insurance providers are residents of the exporting country, we get:

BoP of country A:

Import of goods: 50

Import of freight and insurance: 5

Invoiced amount: 55

Export of goods: 100

Export of freight and insurance: 20

Invoiced amount: 120

The values for import and export of freight and insurance services will be recorded in the services account of BoP. In order to ensure coherent statistics, they will be transferred to ITSS as well:

ITSS of country A:

Import of freight and insurance: 5

Export of freight and insurance: 20

### BoP estimations

In practice, BoP uses IMTS as a source for goods trade. As IMTS records import at CIF, while BoP records the same trade at FOB, a correction of IMTS is done, changing CIF values to FOB values before inclusion into BoP. The difference between CIF and FOB is recorded as freight transport and insurance to arrive at the figures above. These corrections are known as CIF-FOB corrections.

For export, both IMTS and BoP record goods at FOB, and hence no correction of IMTS is needed. However, as shown in the table above, export of freight transport and insurance should still be shown in BoP in case the suppliers are resident in the exporting country.

In the rest of this document, this addition of freight and insurance import and export to BoP (and ITSS) based on data from goods transactions will be referred to in common as “BoP estimations”.

### Survey data on freight transport and insurance

For ITSS, data may be collected in a survey. The survey may include data on freight transport and insurance. It is assumed that reporters will report freight transport and insurance to the survey in case the transport/insurance has been purchased/sold and invoiced separately from the related goods. For instance, if goods are exported and delivery terms are CIF, it means that the exporter will purchase freight transport and insurance and include the value in the invoice for the goods. Therefore, we have the following invoices in case we imagine that the goods have a value of 100 and that the transport and insurance cost 10:

Exporter

Invoice received:

Purchase of freight transport and insurance: 10

Invoice issued:

Sale of goods, incl. transport and insurance to the border of the importing country: 100+10=110

Importer

Invoice received:

Purchase of goods, incl. transport and insurance to the border of the importing country: 100+10=110

In case transport and insurance are purchased from suppliers which are not resident in the exporting country, the exporter will report to ITSS survey:

Import of freight transport: 10

The importer will not report to ITSS survey as no separate invoice for freight transport and insurance has been received.

### Potential double counting and undercounting

When data on freight transport and insurance are derived from the BoP estimations described above, a combination of these data with survey data on freight transport and insurance lead to double counting and undercounting. To illustrate the issue, consider an import to country A from country B with the following values:

Raw value of goods: 100

Value of transport and insurance from border of B to border of A: 10

This transaction will be registered differently in BoP estimations and ITSS survey depending on the delivery terms and the nationality of the transport and insurance suppliers. Mapping the four different combinations of delivery terms and nationality of the transport and insurance suppliers, the following table appears:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Flow | Delivery terms | Transport and insurance supplier | Goods  invoice | Transport and insurance invoice | Gross import - money flow | Gross export - money flow | Net import - money flow | BoP goods | BoP estimations | ITSS survey | Gross import - statistics | Gross export - statistics | Net import - statistics |
| Import A <- B | CIF | A | A <- B: 110 | A -> B: 10 | 110 | -10 | 100 | 100 | 0 | -10 | 100 | -10 | 90 |
| Import A <- B | CIF | B | A <- B: 110 | B -> B: 10 | 110 | 0 | 110 | 100 | 10 | 0 | 110 | 0 | 110 |
| Import A <- B | FOB | A | A <- B: 100 | A -> A: 10 | 100 | 0 | 100 | 100 | 0 | 0 | 100 | 0 | 100 |
| Import A <- B | FOB | B | A <- B: 100 | A <- B: 10 | 110 | 0 | 110 | 100 | 10 | 10 | 120 | 0 | 120 |

Line 1 in the table reads like this: Goods are imported to A from B with CIF delivery terms and transport and insurance is handled by a supplier of country A. As delivery terms are CIF, transport and insurance will by purchased from the supplier by country B and included in the goods invoice. Therefore, there will be a goods invoice at a value of 110. Moreover, a transport and insurance invoice is sent from A to B with a value of 10. So based on the actual money flow, gross import of country A is 110, gross export is 10 and net import is 100. BoP will record import of goods at 100 (the FOB value). The transport and insurance will be treated as payable by the importer, so it will be a resident to resident transaction, so no correction is done. However, the transport and insurance supplier will report export of 10 to the ITSS survey. Consequently, BoP and ITSS will show gross import of 100, gross export of 10 and net import of 90. In other words, there will be an undercounting of 10 in the net import compared to the actual money flow.

By reading the remaining lines in the same fashion, it becomes evident that line 4 reveals a double counting of 10, whereas in line 2 and 3 the net import in statistics matches the net import as it appears based on the actual money flow.

For an export from country A to country B, the table looks like this:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Flow | Delivery terms | Transport and insurance supplier | Goods  invoice | Transport and insurance invoice | Gross export - money flow | Gross import - money flow | Net export - money flow | BoP goods | BoP estimations | ITSS survey | Gross export - statistics | Gross import - statistics | Net export - statistics |
| Export  A -> B | CIF | A | A -> B: 110 | A -> A: 10 | 110 | 0 | 110 | 100 | 10 | 0 | 110 | 0 | 110 |
| Export  A -> B | CIF | B | A -> B: 110 | A <- B: 10 | 110 | -10 | 100 | 100 | 0 | -10 | 100 | -10 | 90 |
| Export  A -> B | FOB | A | A -> B: 100 | A -> B: 10 | 110 | 0 | 110 | 100 | 10 | 10 | 120 | 0 | 120 |
| Export  A -> B | FOB | B | A -> B: 100 | B - > B: 10 | 100 | 0 | 100 | 100 | 0 | 0 | 100 | 0 | 100 |

Line 2 reveals an undercouting of 10 and line 3 reveals a double counting of 10. For line 1 and 4, the net export in statistics matches the net export as it appears based on the actual money flow.

### Potential solutions

The problem of undercounting and double counting can be solved by changing either the ITSS survey or the BoP estimations.

*No data collection in the ITSS survey*

The most simple solution would be to collect no data on freight transport and freight insurance in the ITSS survey. As it can be seen from the tables above, the sum of BoP goods value and BoP estimations in all cases matches the net money flow. Therefore, there will be no double counting or undercounting, if no data are added to BoP services and ITSS based on the ITSS survey. However, this is true only for freight transport and insurance services related to goods which cross the border of the compiling economy, as BoP estimations are done only for these transactions. In case a transport operator of country A moves goods between country B and C and invoices country B for the service, a transaction is done, which cannot be accounted for by the BoP estimations. In the same manner, in case a manufacturer of country A pays a transport operator of country B for moving goods from country B to country C, this transaction also cannot by accounted for by BoP estimations. Therefore, a solution where no data on freight transport and freight insurance is collected in the ITSS survey risks underestimating the total trade in freight transport and freight insurance significantly.

*Only cross-trade collected in the ITSS survey*

As a total elimination of freight transport and freight insurance from the ITSS survey may lead to underestimation, an alternative solution may consist in collecting only cross-trade in the survey. Cross-trade is defined in this context as freight transport and insurance services in connection with movements of goods outside of the compiling economy. This solution will ensure that no undercounting and double counting can happen related to the goods that cross the border, while at the same time freight transport and insurance related to goods which are moved outside the border of the compiling country will not be missing. However, the solution is viable only insofar as reporters are able to distinguish cross-trade from trade related to goods crossing the border and report only the former.

*Estimations based on invoice value*

In case the ITSS survey is not changed, changes must be made in BoP estimations in order to solve the problem of potential undercounting and double counting. The solution would be to calculate BoP estimations as invoice value – FOB, instead of CIF – FOB and to do this for all goods, irrespectively of the nationality of the transport and insurance supplier. This will ensure that in all cases the sum of BoP goods and BoP estimations will equal the money flow from the goods transaction. Hence, it will be unproblematic to add the separate service transactions which are collected in the ITSS survey. Moreover, it could be considered an additional advantage of this approach that the available information on the nationality of transport and insurance suppliers - which is often of a questionable quality - is no longer used. The result of the invoice based approach can be illustrated by adding invoice based estimations to the tables analysed above:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Flow | Delivery terms | Transport and insurance supplier | Goods  invoice | Transport and insurance invoice | Gross import - money flow | Gross export - money flow | Net import - money flow | BoP goods | BoP estimations | ITSS survey | Gross import - statistics | Gross export - statistics | Net import - statistics |
| Import A <- B | CIF | A | A <- B: 110 | A -> B: 10 | 110 | -10 | 100 | 100 | 10 | -10 | 110 | -10 | 100 |
| Import A <- B | CIF | B | A <- B: 110 | B -> B: 10 | 110 | 0 | 110 | 100 | 10 | 0 | 110 | 0 | 110 |
| Import A <- B | FOB | A | A <- B: 100 | A -> A: 10 | 100 | 0 | 100 | 100 | 0 | 0 | 100 | 0 | 100 |
| Import A <- B | FOB | B | A <- B: 100 | A <- B: 10 | 110 | 0 | 110 | 100 | 0 | 10 | 110 | 0 | 110 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Flow | Delivery terms | Transport and insurance supplier | Goods  invoice | Transport and insurance invoice | Gross export - money flow | Gross import - money flow | Net export - money flow | BoP goods | BoP estimations | ITSS survey | Gross export - statistics | Gross import - statistics | Net export - statistics |
| Export  A -> B | CIF | A | A -> B: 110 | A -> A: 10 | 110 | 0 | 110 | 100 | 10 | 0 | 110 | 0 | 110 |
| Export  A -> B | CIF | B | A -> B: 110 | A <- B: 10 | 110 | -10 | 100 | 100 | 10 | -10 | 110 | -10 | 100 |
| Export  A -> B | FOB | A | A -> B: 100 | A -> B: 10 | 110 | 0 | 110 | 100 | 0 | 10 | 110 | 0 | 110 |
| Export  A -> B | FOB | B | A -> B: 100 | B - > B: 10 | 100 | 0 | 100 | 100 | 0 | 0 | 100 | 0 | 100 |

As it can be seen in the tables, estimations based on invoice value ensure that the net import/export in statistics always corresponds to the net money flow. It should be noted that this solutions is not fully in line with BPM6, as BPM6 requires BoP estimations to be calculated as CIF – FOB. However, there are indications that the upcoming BPM7 might apply an invoice based principle to the BoP estimations.