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Measuring Global Production**Price and volume measures for merchanting of goods and sending goods abroad for processing****Prepared by Eurostat¹***Summary*

One of the key indicators of national accounting is economic growth. The 2008 System of National Accounts requires the recording of transactions on a strict change of ownership principle and this had consequences for the measuring of processing abroad and merchanting activities. Developing guidance on the price and volume measurement of these global production arrangements is an important issue and was highlighted as one of the priority areas for further research in the Guide to Measuring Global Production.

This paper presents the methods and recommendations for measuring prices and volumes of merchanting and processing abroad activities which have been developed by an EU Task Force on Prices and volumes measurements.

¹ Prepared by Andreas Dollt.

I. Introduction

1. Merchanting of goods and sending goods abroad for processing are increasingly important dimensions in global production arrangements. This was reflected in the updated 2008 SNA and ESA 2010. Measuring the price and volume component of these activities is a further challenge for national accounts.

2. In January 2015 a Eurostat-chaired task force on price and volume measures in national accounts started its work. One of its tasks was to analyse and provide recommendations on price and volume measures for merchanting and processing abroad activities. The task force met in April and October 2015 and in January 2016. As a result of these meetings an update of the Eurostat handbook on price and volume measures in national accounts was published in February 2016 (see <http://ec.europa.eu/eurostat/product?code=KS-GQ-14-005>). The work results of this task force are reflected in this paper.

II. Recording of Merchanting and Goods Sent Abroad for Processing

3. With the 2008 SNA and ESA 2010 the application of the rules on change of ownership of goods has been made universal. The consequence was that merchanting activities have to be recorded as imports (shown as negative exports) and exports of goods in the country where the merchant is resident. Furthermore, goods sent abroad for processing have to be recorded on a net basis, as opposed to a gross recording under 1993 SNA and ESA 95, resulting in recording of imports or exports of the processing service provided (see ESA 2010, para 1.51, 3.164, 9.48(e), 18.33ff, 18.38ff).

4. Detailed recommendations on possible data sources and how to record merchanting and specifically processing abroad activities were made by Eurostat in its 'Manual on goods sent abroad for processing' (see <http://ec.europa.eu/eurostat/product?code=KS-GQ-14-003>).

5. However, for the recording in practice it needs to be stated that availability of data sources is generally difficult and diverse for these activities, in particular at the detailed product and industry breakdowns for supply/use tables, and optimised methods are still under development within countries. This needs to be kept in mind when assessing price and volume measures for merchanting and processing activities.

III. Prices and Volumes of Merchanting and Processing Activities

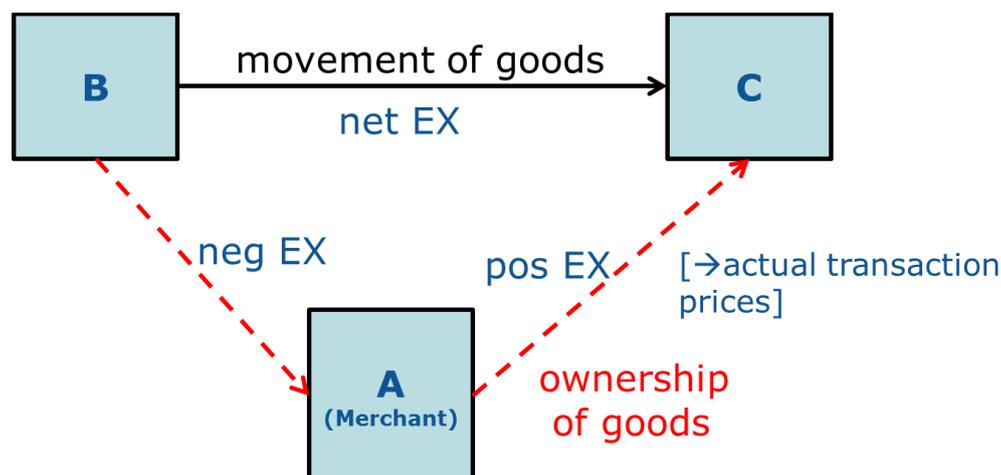
A. Prices and Volumes of Merchanting

1. Methods and Concepts

6. Merchanting occurs when merchants or commodity dealers buy from non-residents and then sell again to non-residents. The important feature in this concept is that exports of goods occur without the good crossing the border of the country where the merchant is resident (see ESA 2010 para 3.164). The standard model of goods under merchanting is that goods are purchased by a company in country A from a producer in country B. The goods

are sold on to a customer in country C, but without the goods ever entering country A.² By convention purchases and sales of merchanted goods are recorded under exports. Purchases are shown as negative exports, so that finally a 'net export of goods under merchancing' is recorded in the country where the merchant is resident. In the current accounts merchancing activities are to be valued at the actual transaction price, and not fob like regular exports. The preferred data source is enterprise surveys of the country where the merchant is resident. An alternative or complementary source is the balance of payments statistics.

Merchandising (A = country where the merchant is resident):



7. When recording the net export of goods under merchancing (= 'positive export' less 'negative export' value) care needs to be taken that separate transport or storage activities are actually recorded separately. In fact these activities would constitute an import of services to country A on their own.

8. In cases when inventories of goods are kept by the merchant, the net export will comprise the merchancing margin, changes in inventories and possibly holding gains/losses of goods kept in inventories. The merchancing margin would be:

merchandising margin = 'pos EX' - 'neg EX' + changes in inventories of goods destined for merchancing

with the changes in inventories being positive for additions and negative for withdrawals

9. If changes in inventories of the goods under merchancing are not recorded at replacement costs, i.e. the actual transaction price in country B at the time of withdrawal, possible holding gains would need to be deducted in order to calculate the margin. As information on changes in inventories is rather rarely available in the desired form, it will be necessary to estimate these values, using deflation methods and applying appropriate price indices and average prices. This means on the other hand that estimates of the volume of changes in inventories are available from these calculations. For this reason the calculation of volumes of changes in inventories is not dealt with further in this document. Holding gains are to be excluded from volume changes.

² It should be mentioned that B and C could also be two units in the same country; the transaction would still be classified as merchancing as long as the goods traded do not enter the country where the merchant is resident.

10. The theoretically ideal method for estimating the volume of merchanting would be to deflate the negative export (purchases) and the positive export (sales) of the goods under merchanting separately. The difference between the two deflated figures would provide the volume of the merchanting margin. The double-deflation method might be difficult in cases where the value of the traded good is high and the merchanting margin is relatively small. Erratic time series might appear in that case.

11. Goods under merchanting are goods subject to international trade. The price, and hence also price change, of such goods is determined on the international market. A relevant price index should therefore reflect price changes on the international market expressed in the domestic currency of the merchant. Such a price index could be an international price index for the relevant product group (for example for crude oil traded), adjusted for exchange rate changes. A domestic import or export price index for the relevant product group might be used in case the price development is similar to the international one. The price development on the international market might also be observed using the producer price index of the good in the country of origin and the PPI in the country of destination, adjusted for exchange rate effects where necessary.

12. Alternative methods would aim at directly deflating the value estimated for merchanting. In such a case appropriate import or export price indices related to the good under merchanting should be used. If the net export mainly consists of trade margins another possibility is deflation with an appropriate domestic wholesale trade margin index in the country where the merchant is resident, although it might be necessary to adjust the domestic wholesale trade margin index for exchange rate effects. This approach assumes of course that the exchange rate adjusted domestic wholesale trade margin show the same price development as the international merchanting margin.

2. Possible Data Sources

13. As mentioned above for the current price estimate of merchanting the preferred data source is enterprise surveys of the country where the merchant is resident. An alternative or complementary source would be the balance of payments statistics. For the volume estimate the situation is much more diverse. It mainly depends on the individual product (group) under merchanting and prices statistics available for this product. International price indices are desirable but very often not available. Secondly, detailed information on these price indices is not always readily available and uncertainty on suitability and quality of these indices remains. However, these are items that could be overcome with international cooperation. Domestic import or export price indices are available. But generally care must be taken that the scope of the price index chosen matches as good as possible with the product group under merchanting. Otherwise, there is a danger that a bias is introduced in the estimates.

3. Implementation in practice

14. Estimates of the merchanting margin need to be fully integrated in the core national accounts. It is an integral part of export of goods and output. An important item is the breakdown by products. It is likely that the margin will concentrate on certain internationally traded products. Best estimates will be achieved in the integrated supply and use tables framework at current prices and for the volumes in previous year's prices. It is shown as part of export of goods and as output in the industry where the merchant is classified.

4. Assessment of Methods

15. For goods under merchanting the theoretically best method would be the double deflation of the goods acquired under merchanting (negative export) and the goods sold

under merchanting (positive exports) with suitable PPIs of the good in the country of origin and in the country of destination. An adjustment for exchange rate effects might be necessary. If suitable PPIs are not available the export price index of the country of origin and the import price index of the country of destination for the good under merchanting and adjusted for exchange rate effects might be used. Other methods would aim at deflating merchanting with appropriate import or export price indices in the country where the merchant is resident, again adjusted for exchange rate effects where necessary. Where double-deflation is not available or produces unreliable results, an acceptable method would be deflation of the merchanting margin with a suitable domestic wholesale trade margin index. An adjustment of the index for exchange rate effects might be necessary.

16. Based on existing experience discussed in the Eurostat task force on price and volume measures, it is recommended to use the same price index for both the import (purchases) and export (sales) unless there are price indices available that are more or less perfectly relevant and reliable for the transactions concerned. Using different price indices could easily introduce bias and sampling errors of different size and direction resulting in a corrupted volume change of the merchanting margin.

B. Prices and Volumes of Goods Sent Abroad for Processing

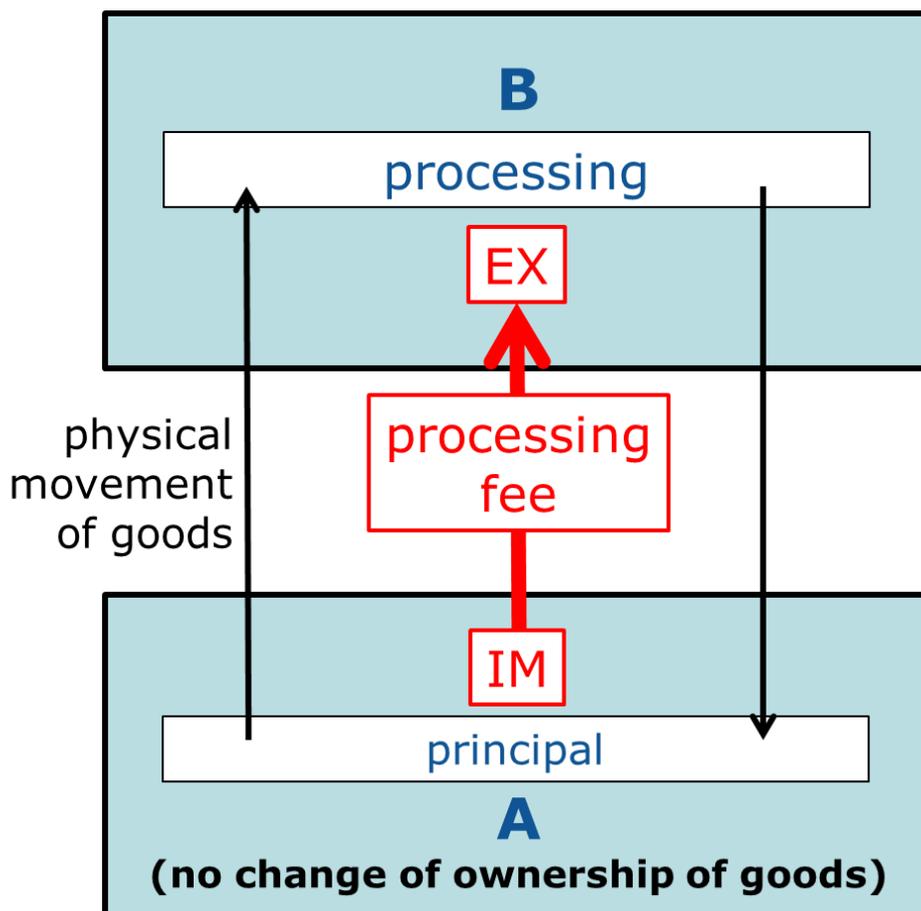
1. Methods and Concepts

17. Under ESA 2010, goods sent abroad for processing are recorded on a strict change-of-ownership basis, meaning that where goods sent abroad do not change ownership, they are excluded from the trade in goods data. Instead, the cost of the processing service is recorded as trade in services (manufacturing services on physical inputs owned by others). This reflects an increasingly important economic activity in many countries. However, in practice estimating this type of manufacturing service and its price and the volume component presents a challenge.

18. It is necessary to look at both sides of the processing activity, i.e. the import and the export of processing services. There are no specific sections in CPA or NACE covering goods sent abroad for processing as such. Instead, these activities will be included within the sections related to the products concerned and may differ from country to country.

19. When estimating the processing service care must be taken that the transport margin and possible further separate costs (for example insurance, taxes, duties or fees) are separated out, depending on the data sources used.

Goods sent abroad for processing:



Export of 'manufacturing services on physical inputs owned by others'

20. Different options exist for estimating the volume of the processing services. Extrapolating a base year value with the development of a quantity index of the goods processed is generally not recommended. The products processed will usually be somewhat heterogeneous and it will be very difficult to construct sufficiently homogenous quantity indices.

21. The ideal method would be to have sufficiently detailed information on the processing service itself through an exactly corresponding, suitable service producer price index (SPPI). Deflation with the SPPI would provide the volume in previous years' prices. However, such SPPIs are generally not available yet. In practice the following options could be applied:

(i) After identification of the processing activity at detailed level (CPA) a suitable domestic SPPI of the similar type of processing service should be used in order to deflate the current price value. In a number of cases the exported processing activity will be valued in a foreign currency. In that case the domestic SPPI would need to be adjusted for exchange rate effects. The potential drawbacks of this method are to find a suitable domestic SPPI that is sufficiently representative of the exported processing activity, and there is a possibility that the price movement of the same processing activity is different for the export market vis a vis the domestic market, even after adjustment for exchange rate effects.

(ii) A double indicator method, i.e. to deflate separately the import value and export value of the good under processing. In that case suitable import and export prices should be used for deflation. This method may entail statistical problems as the processing fee will usually be small compared to the values of the goods imported and exported, and therefore erratic values might occur. It is recommended therefore only if relevant and reliable price indices are available.

(iii) The exported processing fee is deflated by the export price index of the goods concerned. This should be done at a detailed product level. The export price index should be as close as possible to the good processed and exported. This might be difficult in cases where different and heterogeneous types of products are processed. The price movement of the underlying good might be different from the price development of the processing fee. However, if possible, price movements for the good in question need to be monitored continuously. Care must also be taken when the processed good is also produced domestically and exported. Price developments for both categories of the same product might be different and the appropriateness of the underlying export price index needs to be assured in that case.

(iv) In cases where there are currently no other options available, appropriate wage indices linked to employment in the processing activity might be used to extrapolate the processing service over time. This method is based on the assumption that the development of domestic wages follows the same path as the price of the exported processing service. Such a method should be considered as a last resort and phased out over time, as alternative approaches are developed.

Import of 'manufacturing services on physical inputs owned by others'

22. In case of imports of processing services, similar methods as for export of processing services could be applied:

(i) If a main country of origin of the imported service can be identified and a suitable quality SPPI or PPI of the processing industry is available from this country, this price index might be useful to deflate the current value processing fee. An additional adjustment of the price index for exchange rate effects might be necessary.

(ii) The double indicator method might be applied as explained for the export of processing services. The difficulties described above apply here as well.

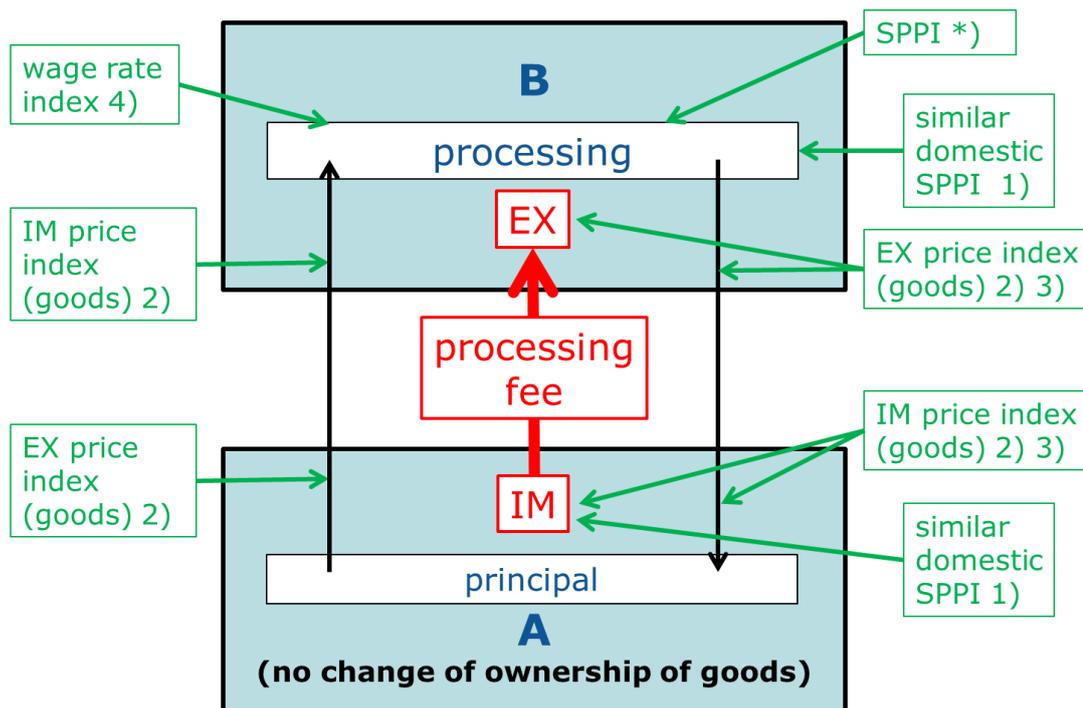
(iii) An import price index of the processed good might be used for deflation of the imported processing fee. Potential issues to address here are the problem of heterogeneity of the products processed, possible different price developments of the goods and the processing fee, and that the import price index may refer to different uses of the product and not only to processing.

23. If a suitable import price index is not available, an alternative could be to use the export price index of the main exporting country or countries (weighting). In that case exchange rate effects might influence the price movement and therefore need to be adjusted for.

(iv) As a last resort, the development of wage indices in the main processing country might be used. An adjustment for exchange rate effects might be necessary. The comments above for the export of processing services apply here as well and this method should be phased out over time.

24. It is important to distinguish the import of processing services from goods sent abroad for repair, as well as from merchanting.

Example on price and volume measures for goods sent abroad for processing:



*) numbers in this diagram refer to the numbering sequence above in the text for exports and imports of processing services

3. Possible Data Sources

25. Main data sources for estimates of goods sent abroad for processing services and relevant adjustments to trade statistics data are international merchandise trade statistics (with nature of transaction codes) and enterprise surveys (broken down by products).

26. In order to estimate the volume of the processing service a variety of potential price statistics is available, for example suitable domestic SPPIs of similar processing activities, suitable export and import price indices of the goods concerned or wage rate indices linked to the processing activity. However, no general recommendation can be given on the preferred data source. The difficulty will be to identify that price index that matches best the scope of the processing service in terms of activities covered and the development of the values of the actual processing activity. Availability and quality of data sources will be different from country to country and for different products.

4. Implementation in practice

27. Estimates of exported and imported services in connection with goods sent abroad for processing (manufacturing services on physical inputs owned by others) and their price and volume component need to be fully integrated in the core national accounts. It needs to be recorded in output and exports or imports and intermediate consumption, respectively. Exported or imported processing services can be classified according to the CPA of the goods being processed: for example clothing products, petroleum products and computer products. Best estimates will be achieved in an integrated supply and use tables framework in current and previous year's prices, in particular in connection with the transport margin involved.

5. Assessment of Methods

28. The theoretically best method for volume estimates would be the use of appropriate SPPIs for the processing service itself. However, such SPPIs are generally not available yet.

29. Acceptable alternative methods are the ones listed above under 1) to 4) for exports and imports of processing services on physical inputs owned by others. Estimates of processing services constitute a relatively new statistical field and current price methods are still under development. Consequently, new and improved statistics, such as price series, can also be expected to be developed further. This would allow for a constant improvement of the methods applied for volume estimates. It is strongly recommended that the processing service in previous years' price is analysed in a supply and use table framework, as this will help providing a consistent picture. In practice the best method to be applied for volume estimates will very much depend on the type of service concerned, availability and quality of data sources and the situation in a country.

C. Further Developments

30. The use of processing services abroad is particularly relevant for bigger enterprises and international enterprise groups, though not only. The processing might even be undertaken by a subsidiary of an international enterprise group. In that case the use of internal transfer prices might further bias statistics and corrupt volume estimates. Eurostat and the European Statistical System is currently building up a register of European enterprise groups and actively encourages the profiling of bigger enterprise groups. These activities may also help improving statistics from this perspective.

IV. Conclusions

31. Good price and volume measurement of merchanting and sending goods abroad for processing depends ultimately on further improvements in sources and methods for the current price estimates of these activities. However, a number of different methods exist for both activities. An overview is given in this paper. The suitability of these methods has been assessed in general. But this does not allow to conclude that in practice one method will always provide better results than other methods. The best method in a specific situation will depend on availability of sources and methods, and this will be different from country to country and may even differ from product to product within one country. On the other hand, with further improvements and harmonisation of sources and methods for the current price estimates, a convergence to specific methods for price and volume measures should be achieved. It is above all generally recommended that analysis of the transactions in current and previous year's prices should be made within a supply and use tables framework.

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