

Chapter 5

Measuring global production: data sources and compilation challenges

Introduction

5.1 This chapter focusses primarily on the measurement challenges related to the first three categories of global production arrangements introduced in Chapter 2: Goods sent abroad for processing (case A in Table 2.1), Merchanting (case B) and Factoryless goods production (case C). The challenges become particularly apparent in the context of the changed accounting standards, the System of National Accounts 2008 (2008 SNA) and the Balance of Payment and International Investment Position Manual, sixth edition (BPM6). This calls for a review of the data collection methods and data analysis.

5.2 The chapter examines the changes in the accounting standards between the 1993 and 2008 versions of the SNA and differences between the fifth and sixth versions of the BPM, particularly with respect to the data needs and analysis required for each of the three forms of global production mentioned above. The conceptual underpinnings of these changes are explained in the Globalization Guide. The changing concepts are generally well understood, while the required modifications in data collection are not always straightforward. Furthermore, the International Merchandise Trade Statistics (IMTS) 2010 have a different conceptual basis and their reconciliation with the imports and exports as recorded in the national accounts and the balance of payment requires several adjustments (see Table 10.2 in the BPM6).

5.3 The data items needed to make these adjustments may not be readily available, so these deserve further attention. Without guidance there is concern that national statistical institutes (NSI) and other compiling agencies will employ approaches that are different enough to hamper international comparability of national accounts and balance of payments. However, it is acknowledged that compilers will use different methods depending on the specific characteristics of institutional arrangements, data sources and statistical systems in their countries.

5.4 This chapter follows a step-by-step approach by reviewing the data items needed to properly measure outward and inward processing, merchanting and factoryless goods production. This guidance is not only limited to the recording of international trade flows but

also addresses some aspects of measuring production such as the recording of output, intermediate consumption and inventories.

5.5 Available data sources may be incomplete, or insufficiently reliable to carry out some of the steps needed to obtain the required estimates. The following section in this chapter provides a list of existing and relevant data sources and shows how relatively small adjustments in these source statistics may leverage their use in measuring certain aspects of global production and improve the quality of the estimates. This may help assess additional data needs against all current and potential sources of information with a view of minimizing collection cost and response burden.

5.6 This chapter benefits substantially from the work carried out by the Eurostat Task Force on "Goods sent abroad for processing" and the related manual that was compiled as a follow up of the task force report. The chapter reflects on a broad range of experiences including Canada, China, China/Hong Kong SAR, Czech Republic, E.U., Israel, Ireland, Kyrgyzstan, Mexico and the United States (U.S.).

5.7 Nevertheless, it is not expected that the available experiences presented in this chapter completely cover all data issues countries will encounter when dealing with global production. Particularly the experiences from the developing countries are limited at present and as a result underreported in the chapter. Collecting evidence from these countries, including their search for adequate data sources and compilation methods, is an issue for future research.

5.8 Some statistical offices are currently still in the process of studying how to classify and collect data from entities that are part of global production arrangements. In other words, the robustness of data collection in the context of global production is still subject to on-going research. An update of this chapter is recommended once data collection and compilation methods are further advanced in a broader range of countries.

Goods sent abroad for processing (Case A)

Outward processing

5.9 The name "outward processing" is used when a resident company, the principal, sends goods abroad for processing while retaining economic ownership of these goods. After processing the goods may be sent back to the company, or to customers that are resident in the country. However, it is also possible that after processing the goods do not return and are directly delivered to customers in the country where the processing takes place or yet another country.

5.10 The conceptual differences between the 1993 and 2008 SNA in recording goods sent abroad for processing are explained in detail in the Globalization Guide (Chapter 5). Under the System of National Accounts 1993 (1993 SNA) treatment, an ownership change is imputed for the raw materials or semi-processed goods sent abroad for processing and recorded as an export of goods. After processing a second transaction is imputed presenting the import of the manufactured good in a similar way. This imputation of processing related imports and exports is not required in the 2008 SNA as their recording should be fully based on the observation of international product transactions. The main transaction taking place in the context of outward processing is the fee paid for the delivery of processing services.

Measuring production

5.11 Conceptually, moving from 1993 to 2008 SNA leads to a number of changes in the production accounts of companies that send goods abroad for processing. These changes are reflected in Table 5.1 which turns back to the athletic shoe example as introduced in Chapter 2. The table shows that according to the 1993 SNA, output needed to be upwardly adjusted to include the delivery of goods sent abroad for processing. Similarly, intermediate consumption is increased by the imputed purchase of processed goods. As long as the difference between imputed output (30) and imputed intermediate consumption (50) represents the processing fee, the 1993 and 2008 SNA recommendations lead to the same value added.

5.12 One may expect that, not many national accountants were able to follow the 1993 SNA recommendations to accurately make such ownership imputation adjustments in the production account. However, there were cases where NSIs brought production and intermediate consumption carefully in line with international trade statistics as reported by a limited number of companies engaged in outward or inward processing and other adjustments. Without such adjustments, the balancing of supply-use tables was disturbed by the (implicit) mix up of different recording concepts. This is one of the reasons why these accounting recommendations were changed in the 2008

SNA - to improve the internal consistency of the national accounts.

Table 5.1
Outward processing, the production account
according to 1993 and 2008 SNA

	1993 SNA	2008 SNA
Output	140	110
	(=110+30)	
Goods	115 (=85+30)	85
Services	25	25
Intermediate consumption	87 (=37+50)	57
Materials	80 (=30+50)	30
Processing services	0	20
Other services	7	7
Value added	53	53
Compensation of employees	17	17
Gross operating surplus	36	36

5.13 Another consequence of the 1993 SNA recording method of outward processing was that the purchase of processing services (20) was not separately recorded, since this fee is assumed to be included in the value of the return flow of the good after processing.

5.14 In the case of outward processing the 2008 SNA guidelines lead to simplification of the recording of production. The accounts can be constructed straightforwardly by following the transactions as reported in business surveys, without the need of making imputations. However, this entails an effort to bring trade flows in line with the reality of manufacturing.

5.15 Regarding the correct observation of outward processing, it is recommended to explicitly include in the questionnaires of business surveys a data item on the purchases of manufacturing services. Further, a distinction should be made between services purchased from domestic suppliers and from suppliers abroad. The wording associated with industrial processing (sometimes addressed as custom work) is cumbersome and the questionnaires need to be reviewed to make sure that they are clear to respondents.

5.16 Further, outward processing may lead to inventories of raw materials or processed goods that are under ownership of the principal but have a physical presence in the country of the processor. Therefore, inclusion of a separate question in the questionnaire on inventories held abroad would be particularly helpful. If this is not possible, it is recommended that as a minimum the instructions in business surveys highlight explicitly that also inventories held abroad must be reported.

5.17 Keeping in mind that not all firms are engaged in outward industrial processing, there should be an assurance that (i) the survey frame is comprehensive and includes such firms and (ii) the sample size is sufficient and with an effective sampling strategy. A priori information or company profiling can be helpful in identifying large companies engaged in processing. Such companies would ideally be in the take-all portion of the sample. At the very least, they should be in the take-all portion of the annual survey, if such a survey is used to supplement and benchmark the monthly or quarterly surveys.

5.18 According to the International Standard Industrial Classification of All Economic Activities, Revision 4 (ISIC Rev.4) the principal is classified to the class that corresponds to the activity representing the complete production process, i.e. it is classified as if it were carrying out the complete process, including the contracted work. For national accounting purposes it may be useful to group these companies, engaged in substantive outward processing, under a separate subcategory. This is important for compilation as well as for analytical reasons, as the cost structure of such companies may differ substantially from companies that carry out the physical transformation themselves.

Measuring international trade in goods and manufacturing services

5.19 Table 5.2 presents the international transactions in the simplest case of outward processing in which the goods after processing re-enter the country of the owner. As illustrated in the table, the required changes in the recording of international transactions logically follow those made in the production account. In the 2008 SNA the imputation of export and import flows is no longer required. The only transaction that needs recording is the processing fee paid to the processor abroad. One key measurement challenge is the adjustments that must be made to merchandise trade statistics to bring them in line with the requirements of national accounts and balance of payments. Another challenge poses the situation in which the processed goods do not return to the country of the principal. Both measurement issues are further discussed below.

Table 5.2
Outward processing, international transactions
according to 1993 and 2008 SNA

	1993 SNA	2008 SNA
Exports	30	0
Goods	30	0
Manufacturing services	0	0
Imports	50	20
Goods	50	0
Manufacturing services	0	20

5.20 Practically each national accounts, or balance of payments, compiler will use the IMTS 2010 data collection framework as a starting point for the estimation of imports and exports of goods in national accounts and balance of payments. Like previous editions, IMTS 2010 gives priority to statistics that reflect physical cross-border movements of goods. This recording concept of cross-border flows differs in several important aspects from the conceptual framework adopted in the 2008 SNA and BPM6, which is the recording of imports and exports purely on transaction basis.

5.21 IMTS 2010 (paragraph 1.20) mentions that all cases of goods sent for processing, and goods resulting from processing, are to be included in the merchandise exports and imports of the countries at their full (gross) value. As these shipments of goods do not coincide with economic transactions they should not be recorded as imports or exports in the national accounts or the balance of payments. Essentially, goods for processing (where there is no change of ownership) need to be separately identified so that they can be removed from the IMTS source data, before they are integrated in the national accounts or balance of payments. The options to make such adjustments in a sufficiently robust way may differ from country to country.

5.22 More generally, in the context of outward processing the following data items, and corresponding data adjustments, are required:

- Adjustments in IMTS to remove (i) the merchandise trade exports for the goods being sent abroad for processing and (ii) the merchandise trade imports for the goods being returned to the domestic economy following processing;
- In case purchased abroad, include a recording of these imports of raw materials or semi-processed goods;
- Estimate the export of processed goods, in case these do not physically return to the country of the principal;
- Estimate the import of services associated with the purchase of processing services from abroad;
- Estimate (changes in) inventories held abroad in connection to outward processing.

5.23 Each of these items is further discussed below.

a) Adjustments in merchandise trade statistics

5.24 In many countries customs information form the basis of merchandise trade statistics. As mentioned these need to be translated to national accounts and balance of payments concepts. The adjustments can include coverage, timing, valuation and country attribution (origin-shipment) adjustments, but also adjustments needed to record international trade on a change of ownership basis for goods under processing arrangements (or goods under repair).

5.25 Some or most of the merchandise subject to processing may qualify for exemptions from normal customs duties (exempt or partially exempt). Under these circumstances, it is expected that customs' records would identify such merchandise. For example, information on re-exports may be widely available in the customs information. It is quite possible in some countries that available customs information is not fully utilized in the merchandise trade statistics. Some of this information may already exist on available customs fields that are not fully captured or ignored for merchandise trade statistics purposes. In other words, existing but non-tabulated or analyzed fields might be able to provide important information for adjustment purposes. This might involve additional efforts by compilers as well as negotiations with customs agencies for access to additional records on customs documents.

5.26 The desired additional information from customs records would include the values and commodity codes of the merchandise that has been sent abroad for processing, the processing fees paid on these goods, where the work is undertaken and where the processed goods are destined, etc. The information may also include the dates of departure and return of all temporarily shipped merchandise.

5.27 The commodity detail that would be associated with any of these categories of temporarily shipped merchandise would then form the basis of a national accounts or balance of payments change in ownership adjustment for trade in goods. Exports related to outward processing would have to be removed in the period in which they were sent abroad as well as for the period in which they returned.

5.28 For example within the European Union (EU), specific customs procedures are used to identify certain types of trade, including goods for inward and outward processing. These types of trade are identified by "nature of transaction codes" within customs procedures. While these codes are typically used to compile IMTS, they can be a source of information to identify goods for processing.

5.29 In the context of the nature of transaction codes, outward processing is defined as the customs procedure under which goods that are in free circulation in an economy may be temporarily exported for manufacturing, processing or repair and then re-imported with total or partial exemption from import duties and taxes.

5.30 While such nature of transaction codes may be a useful source of information to the compiler, they do not readily identify whether there is a change of ownership or not, just that the goods are intended for re-shipment. However, identifying whether the goods are being returned to the domestic economy seems a reasonable proxy for determining whether there is no change of ownership.

5.31 The nature of transaction codes can be used as a source for detecting and extracting commodity flows subject to processing, but only when this classification is in effective use by the customs authority. If goods for processing are exempt from certain taxes, the incentives are in place to report high quality data. Without such tax breaks the quality of the obtained data may not be sufficient.

5.32 The EU Manual on Goods Sent Abroad for Processing recommends consulting the customs administrations regarding the quality and use of information obtained from transaction codes. As mentioned it is important to understand companies' practices with respect to the declaration of goods for processing and the suitability of actual customs records to identify them. This may require a one-off survey coordinated by custom administration on behalf of balance of payments and national accounts compilers.

5.33 Alternative options need to be considered when information on nature of transaction codes of sufficient quality is not available from the merchandise trade statistics. It is possible that information on the (magnitude of) value of goods sent abroad for processing be obtained from business surveys in combination with questions on payments of processing fees to foreign processors. This information can be used to make the required adjustments in the merchandise trade statistics.

5.34 Obtaining these data items from business surveys may lead to increased response burden that is considered undesirable. Under such conditions the fall back option is to make crude adjustments based on information on payments of processing fees to foreign processors as derived from business surveys and international trade in services surveys. The assumption used may be that the processing fee reflects the difference between the value of goods sent for processing and the value of goods returning to the home country of the owner. This would imply that the size of downward adjustments of exports and imports are such that the trade balance for goods reflect the service fee. As the fee is recorded separately, the overall trade balance would be unaffected.

5.35 A possible way to measure the unknown gross flows to be removed is through measuring the processing fees to processed goods ratios estimated for a sample of similar firms in terms of economic activity, country of origin/destination of the goods, etc. for which all this information is readily available.

5.36 However, such adjustments may give rise to disturbances in the trade balance, particularly when there is uncertainty about the amount of goods not returning after processing to the country of residence of the principal. Again, under such data conditions it is advisable to run a one-off survey to obtain at least a general picture of the importance of flows of processed goods not re-entering the domestic economy.

Country case study 5.1**International Merchandise Trade Statistics in the European Union**

The compilation of the IMTS (named International Trade in Goods Statistics, ITGS, at the level of the EU) relies principally on customs records complemented, as appropriate, by additional sources to enhance their coverage (e.g. to include electricity, or trade in vessels and aircrafts). These statistics essentially reflect the physical movement of goods across borders.

The IMTS in the EU is based on two data collection systems, called Intrastat and Extrastat. The EU is a customs union and there are no customs frontiers between its member states. The introduction of the single market on 1 January 1993 led to the abolition of customs formalities between the member states which had served as the traditional source of trade statistics and to a clear distinction in the observation methods and collecting systems between the intra-EU and extra-EU trade, giving existence to two data collection systems, i.e. the Intrastat system and the Extrastat system.

Companies that trade within the EU with other member states (so-called Intrastat trade) have seen substantial changes. Detected by means of the value added tax (VAT) information, they declare directly to the statistical authorities. Companies that trade with countries outside the EU (so-called Extrastat trade) declare, as before 1993, only to the customs authorities, and a copy of the customs documents is processed by the statistical authorities.

The Intrastat system is linked to the value added tax system, based on enterprise surveys and data according to the country of consignment for arrivals (imports) and the country of destination for dispatches (exports). Enterprises registered in the VAT register with a sales or purchases of goods from/to other member states exceeding the statistical threshold submit Intrastat declarations. In the Intrastat declaration the information related to the country of origin is not obligatory. The reporting agent in the country of final destination may, therefore, not know at all the non-EU country of origin of the goods. Only the information related to the country of consignment (imports) is available.

The trade of member states with non-member countries (Extrastat) is recorded on the basis of customs declarations (single administrative document). The Extrastat statistics collect data according to the country of origin/final destination.

Goods for processing are recorded on a gross basis in the IMTS. An export is recorded when a semi-finished good is transferred to a foreign processor for processing under contract (outward processing) and an import is recorded when a national processor receives foreign owned goods for processing (inward processing). Goods for processing can to some extent be identified in the IMTS by the nature of transaction codes or the customs procedure codes. It is mandatory for member states to collect the nature of transaction code in Intrastat. The nature of transactions is the sum of characteristics (e.g. purchases or sales, goods sent for processing), helping to determine the different transactions in Intrastat/Extrastat. The nature of transactions is specified by a two digit code as follows:

Operations with a view to processing under contract:

- 41. Goods expected to return to the initial member state of dispatch;
- 42. Goods not expected to return to the initial member state of dispatch.

Operations following processing under contract:

- 51. Goods returning to the initial member state of dispatch;
- 52. Goods not returning to the initial member state of dispatch¹⁷.

In Extrastat it is optional for member states to collect the nature of transaction. It is envisaged that the collection of the nature of transaction should become mandatory with the implementation of the Union Customs Code, at latest in 2020. The customs procedure codes are four digit codes. The two first digits show the current procedure while the third and fourth digit indicate the previous procedure that the goods were placed under.

Some procedures indicate goods for processing:

- 21, 22: Temporary export under outward processing
- 41: Inwards processing procedure – drawback system
- 51: Inwards processing procedure – suspension system
- 91: Processing under customs control

¹⁷ In some EU member states this information is available only by a one digit code.

Some procedures can only exist as a previous procedure:

54: A previous procedure indicating that goods were under inward processing procedure in another member state (suspension system).

92: A previous procedure indicating that goods were under processing under customs control in another member state.

Codes 41, 51 and 91 are import procedures used by the companies (requires an authorisation) when there is a tariff on the materials that are going to be processed. The extent of goods imported for processing where the procedure for normal imports is used is unknown. Customs procedure codes 41 and 51 are used when the goods are expected to be re-exported. In case of code 51 the goods are not in free circulation of the EU ('T1 goods') and after processing the exports of the processed goods must be documented. In case of code 41 the customs duties are paid and the goods are in free circulation ('T2 goods'). When the goods are subsequently re-exported the duties are refunded. Since the goods are in free circulation the goods can without any further notification of the customs authorities stay in the processing economy even though this was not anticipated initially. Due to the re-export of the processed goods both 41 and 51 might represent processing activities under contract. Concerning customs procedure code 91 there is no requirement or intention that the goods must be re-exported following processing. Only when the goods are re-exported it seems reasonable that the goods might have been processed under contract. Only a fraction of the goods imported for processing under customs control should be associated with processing under contract. The ratio between the value of goods that are re-exported and goods that are not re-exported provides an indication of the share of imports for processing under contract. Codes 54 and 92 exist only as a previous procedure indicating that the processing activity has taken place in another member state. Codes 21 and 22 are export procedure codes that are used when the processed goods are expected to return. When there is a tariff on the finished goods the company has an economic incentive to use the codes for processing. The amount of goods imported following processing but which are reported under the procedure for normal imports is unknown. When semi-finished goods are not expected to return after processing, the procedure for normal exports is likely to be used.

b) Estimate purchases of goods (raw materials, semi-processed goods) abroad as imports

5.37 Goods (raw materials, semi-processed goods) to be processed by a foreign processor may be purchased abroad. In such cases these purchases will not show up as imports in merchandise trade statistics as these goods do not cross the borders of the country in which the principal is resident.

5.38 The only way these imports can be observed is asking the respondents of business surveys to report separately domestic purchases of intermediate goods from purchases abroad. Such a split is particularly recommended for industry branches in which outward processing is known to exist more widely. A coherent approach is to combine questions on foreign expenditure on processing services abroad (see the following item) with related imports of goods subject to outward processing.

5.39 In the absence of information coming from business surveys a possible approximation would be to subtract the processing fee paid from the value of the imports after processing as reported in customs records. An error that could easily be made is removing imports after outward processing from merchandise trade statistics without replacement with the actual import value of the goods purchased abroad before processing.

c) Estimate exports directly following processing

5.40 The exports following outward processing will not show up in merchandise trade statistics as the goods have already crossed borders before the transaction in processed goods takes place. The nature of transaction

codes in merchandise trade statistics may be helpful for detecting goods sent for processing that will not return to the domestic economy after processing. If this information is available, and of sufficient quality, the values of these goods sent for processing could be replaced by the eventual transaction value after processing. The best approach would be to match turnover from foreign sales (as reported by the principal in business surveys) with goods sent for processing and not returning back to the home country. A rough approximation of the transaction value would be to add the processing fee paid by the exporting principal to the commodity value reported in customs records at the moment it is shipped abroad for processing.

5.41 Without information of sufficient detail and quality on the nature of transactions, adjustments in merchandise trade statistics cannot be made and are not without risk. Again, an error that could easily be made is removing shipments for outward processing from merchandise trade statistics without replacement with the actual export value of the good after processing.

d) Estimate the import of processing services

5.42 There are two data sources in particular that may provide information on the import of processing fees: business and international trade in services surveys. The latter source is sometimes also referred to as balance of payments surveys. Both types of surveys may not be geared to measure aspects of global production, in particular with respect to services associated with goods that cross the border for processing. However, both surveys can be amended to collect information on purchases of processing services from foreign suppliers.

The Manual on Statistics of International Trade in Services (MSITS) 2010 addresses explicitly in its classification the coverage of manufacturing services on physical inputs owned by others.

5.43 One challenge is to ensure that surveys adequately cover firms engaged in (outward) processing. In this context, one big advantage of business surveys is that they usually cover total domestic activity while the international trade in services survey often have a smaller scope in terms of coverage and sample size. Another advantage of the business survey is obviously the integrated view in which these characteristics of production and output are obtained.

5.44 An alternative approach is to measure the processing fee indirectly as the difference in the values of the goods before and after processing, as observed via the export and the import flows of goods subject to an outward processing arrangement. Box III.2 in the MSITS 2010 explains that the value of the fees charged for manufacturing services on physical inputs owned by others is not necessarily the same as the difference between the value of goods sent for processing and the value of goods after processing. In addition to the processing fee, value differences may also include holding gains and overhead costs. At the same time, such calculations become particularly problematic in case goods do not return to the country of the principal. Further, as the result of physical transformation, the product classification may change before and after processing and this may equally complicate the indirect estimation of the processing fee. Therefore it is recommended to observe the processing fee directly rather than indirectly.

e) Estimate (changes in) inventories held abroad

5.45 The data on inventories are usually collected as part of the business survey. It was recommended before that the design of business surveys should be such that inventories held abroad are captured. A split between domestic and foreign held inventories would be very helpful. Also a split of raw materials versus processed goods would be useful, particularly in providing a broader picture of the commodity flows subject to outward processing. This split would also help properly measure revaluations.

Data validation

5.46 From a theoretical point of view, it is possible to collect information on data items a-e, and to estimate each of them, independently. Many compilers will be making their estimates under less favourable conditions; and therefore, data validation must be part of the estimation procedure. These data validations can be done at various levels of detail.

5.47 Even if information on processing services is largely or solely obtained from the trade in services surveys, it is possible that the coverage of this activity in merchandise trade statistics is superior to that of

services surveys. In other words the merchandise trade statistics may be used to detect omissions in the observed payments of processing fees. There should be a rough relationship between the values of commodity flows and processing fees. Data errors can be detected as well by comparing processing flows as observed from the nature of transaction codes information in merchandise trade statistics and the processing fees as observed in the trade in services statistics. Also, information from business surveys can help validate both the coverage of processing in international trade in services and the international trade flows in customs data.

5.48 All of this could be enhanced by the existence of so-called "importer-exporter" registers associated with merchandise trade statistics. The alignment of these registers with the business register would facilitate data confrontation with other surveys. Some countries have developed importer-exporter registers, which will be linking the merchandise trade by commodity to the firms engaged in this activity. Importer-exporter registers allow tracing detailed commodity trade back to the trading establishments and importer-exporter firms. This can provide valuable possibilities for linking trade data to the related business surveys, especially manufacturing surveys and trade in services surveys, in the case of cross-border processing activity. Tying the aforementioned merchandise trade adjustments to firms in manufacturing via record linkages as well as commodities can increase the accuracy and the alignment of production and trade related data of the examined firms.

5.49 Finally, the above discussed adjustments in IMTS focus primarily on obtaining the total exports and imports according to the 2008 SNA and BPM6 principles; however, without necessarily taking into account a product breakdown. This latter aspect is particularly relevant for the compilation and balancing of supply-use tables. A product breakdown may also help provide a correct presentation of external trade in the context of global production. And even the sub-annual balance of payments and the quarterly gross domestic product (GDP) estimates usually require some degree of commodity detail.

5.50 Referring back to the athletic shoe example of Chapter 2, if a principal sends the midsoles to a foreign processor for final assembly, and the shoes do not return to the country of the principal but are shipped directly to the country of the final user, the exports of the principal, for example estimated as the sum of the value of the midsoles and the processing fee paid, have to be registered as exports of shoes and not as exports of midsoles. Classifying these exports correctly on the basis of the Central Product Classification (CPC) is not straightforward. A default assumption could be to assume that the product breakdown of the goods before processing is the same after processing. This may indeed be a plausible assumption on a higher

aggregation level. These classification issues are equally relevant when making corrections in IMTS in connection to inward processing.

Inward processing

5.51 The name “inward processing” is used when the resident company, the processor, is engaged in the physical transformation of goods that are before and after processing under ownership of a foreign principal. After processing, the goods may return to the country of the principal, or be supplied to customers in the country of the processor, or shipped to yet another country.

5.52 Inward processing arrangements are usually easier to identify and observe than outward processing because the nature of the arrangement is usually explicitly reflected in business surveys.

Measuring production

5.53 Following the 2008 SNA and BPM6 recommendations, the output of the processor represents the manufacturing processing services and not the full value of the manufactured products, as was required according to 1993 SNA. Without the need of making these imputations, the production account can be derived straightforwardly from the revenues and costs as reported in business statistics.

5.54 Following up on the athletic shoes example, introduced in Chapter 2, the output of the processor represents the processing services (20), corresponding in this example to the compensation of employees.

5.55 According to ISIC Rev.4 contractors, or units carrying out an activity on a fee or contract basis, are classified in the same category as units producing the same goods or services on own account. For national accounting purposes it may be useful to present companies that mainly provide industrial services under a separate subcategory. It is important for compilation, as well as analytical, reasons as the cost structure of contract manufacturers will substantially differ from companies carrying out production on own account.

Table 5.3
Inward processing, the production account
according to 1993 and 2008 SNA

	1993 SNA	2008 SNA
Output	50 (=30+20)	20
Goods	50 (=30+20)	0
Services	0	20
Intermediate consumption	30	0
Materials	30	0
Processing services	0	0
Other services	0	0
Value added	20	20
Compensation of employees	20	20
Gross operating surplus	0	0

Measuring international trade

5.56 From the processor’s country perspective, the required changes when moving from the 1993 to 2008 SNA are the mirror image of the changes illustrated in Table 5.2. The shipments of raw materials, and possibly the processed goods, will show up in merchandise trade statistics, but these should not be recorded as imports and exports in the national accounts or balance of payments of the country in which the processor is resident. So the new 2008 SNA and BPM6 guidelines require that the international trade flows related to inward processing, as reported in the IMTS source data, are removed from the import and export estimates in the national accounts and balance of payments.

5.57 In the context of inward processing the following data items, and corresponding data adjustments, are required:

- Adjust trade in goods to remove (i) the merchandise trade imports for the goods received from abroad for processing and (ii) the merchandise trade exports for the goods being returned to the domestic economy, or shipped to a third country, following processing;
- Estimate the exports of services associated with the sale of processing services to abroad;
- If relevant, estimate the value of exports of goods (raw materials, semi-manufactured goods) purchased on the domestic market by the principal abroad, and which are subsequently processed by the domestic processor;
- One may expect that inventories of raw materials or finished products held in the premises of the processor, but under ownership of the principal, are not reported by the processor in business statistics questionnaires. If these inventories are in the accounts of the processor, respective adjustments to exclude them need to be done by statistics compilers.

5.58 The first three above mentioned items are further discussed below.

a) Adjustments in merchandise trade statistics

5.59 As discussed in the former subsection in the context of outward processing, nature of transaction codes similar to those used by the EU can also be used as a source for detecting and extracting commodity flows subject to inward processing, but only when this classification is in effective use by the customs authority and the incentives are in place (the existence of tax breaks) to report to the customs authorities information of sufficient quality.

5.60 Alternatively, information on the value of goods for inward processing can be obtained from business surveys in combination with questions on payments of processing fees by foreign principals. This information can be used to make the required

adjustments in the merchandise trade statistics. But it must be stressed that the principals in processing arrangements generally have a much better view on the value of goods sent abroad for processing than the processors. The processors may not have precise information on value of the materials or semi-processed goods sent to them for processing as they are not the owners.

5.61 A fall back option is to assume a certain relationship between the value of processing services and the value of goods sent for processing, on the basis of which general adjustments can be made in merchandise trade statistics. Import and exports may be downwardly corrected in exactly similar way. However, such adjustments may give rise to disturbances in the trade balance, particularly when there is uncertainty about the amount of goods that remain in the country of the processor. In this situation it is advised to run at least a one-off survey to obtain a general picture of the relationship between processing fees and the product flow values subject to inward processing, and to obtain a view on the significance of those flows that stay after processing in the domestic economy of the processor.

b) Estimate the export of processing services

5.62 There are two data sources in particular that may provide information on the export of processing services: business surveys and the international trade in services surveys. As already mentioned, both surveys can be amended to collect information on the production and export of processing services. The output of processing services in the accounts of the processor is probably easier to observe than the intermediate consumption of processing services in the accounts of the principal. The indirect measurement of exports of processing services as the difference in the values of the

goods before and after processing is not recommended because of the same reasons highlighted in the context of outward processing (paragraph 5.44). It is advised that such indirect measurement is done for data confrontation purposes only.

c) Exports of goods purchased on the domestic market by the principal abroad which are processed by a domestic processor

5.63 From the perspective of inward processing there is no obvious mode of observing these exports. Before processing no cross-border flow of goods is observed and as such these exports will remain unobserved in the merchandise trade of goods statistics. As the domestic processor is not directly involved in the transaction (the domestic purchase of raw materials) it is not reasonable to burden the processor with questions about the country of origin of the materials it processes (domestically purchased or shipped from abroad).

5.64 Alternatively, the value of the export of raw materials or semi-manufactured goods could be obtained by subtracting the processing fees from the value of the export flow after processing. The latter information may be obtained from the cross-border registration as followed in the merchandise trade statistics. A complicating factor is that only part of the processed goods is purchased by the principals in the domestic economy.

Data validation

5.65 The procedures of data validation were already discussed in the context of outward processing. The need of such procedures is equally relevant for analysing the outcomes on inward processing, particularly when the underlying source data are incomplete or not of sufficient quality.

Country case study 5.2

The effects of manufacturing services on the balance of payments of China

Thanks to the open-up policy in the late 1970's, the importance of goods for processing has increased rapidly and this contributed greatly to the development of foreign trade, employment, GDP growth and industry restructuring in China. According to *Monitoring Measures of General Administration of Customs of the People Republic of China on Goods under Goods for Processing*, the following three main types of processing arrangements are identified:

- 1) Processing with imported materials where domestic entities import and purchase the materials, do some manufacturing domestically and sell abroad the finished products after processing. This form of processing to some extent corresponds to the contract producer under a factoryless arrangement (C) as discussed in Chapter 2;
- 2) Processing with supplied materials, where the domestic processors receive but do not purchase materials supplied and owned by foreign entities, process or assemble on order and charge only processing fees when returning the finished products (case A);
- 3) Outward processing is the opposite of (2), foreign entities receive but do not purchase raw and supplemental materials, parts, components and semi-final products supplied and owned by Chinese entities, process or assemble on order and send the finished products to the same Chinese entities after processing.

The total exports and imports related to processing increased rapidly in the past decades. For example, the total volume of goods sent for processing in 1981 was USD 2.5 billion, only 6 per cent of total foreign trade of China while in 2011, the total volume of goods under processing amounted to USD 1306 billion, 36 per cent of total foreign trade of China. Industrial processing is the main source of foreign trade surplus in China. Processing with imported materials

dominates, while the ratio of processing with supplied materials decreased over time. Processing activities have extended from low value added downstream manufacturing to more sophisticated upstream manufacturing, with domestic contribution increasing over time.

In China the Customs is the authority to disseminate goods for processing exports and imports data. Applying the principles of BPM6 leads to the following classification of the above mentioned processing arrangements. Only processing with supplied materials (2) and outward processing (3) are in line with the manufacturing services without a change of ownership, while a substantial part of processing with imported materials should be reclassified from goods for processing to general merchandise under goods account in the balance of payments because change of ownership on goods occurs. Based on Customs data, only net exports of processing can be derived, which in many cases do not equal to the service charges. Also, a complicating factor is that the Customs' classifications on foreign trade are different from those set in BPM6.

Data analysis and cross-checking of inter-agency data in the so-called International Transaction Reporting System leads to improvements in the estimates of processing with imported materials, processing with supplied materials and outward processing. To some degree, this additional data analysis also enables the State Administration of Foreign Exchange to collect service fees of different types of goods for processing and improve the data quality in the future. Cross-border receipts and payments of processing with supplied materials and outward processing may be potential alternatives to the statistics on the relevant goods for processing by the Customs. This is because the former is in better position to meet BPM6 requirements. Furthermore, conceptually speaking, the difference between cross-border receipts and payments is manufacturing services on physical inputs owned by others. However, to get more accurate data, in-depth study on this issue should be made in the future.

Country case study 5.3

The "Maquiladora" Industry Program in Mexico

The "Maquiladora" Industry Program consisted of enterprises that, with the authorization of Mexico's Secretariat of Economy, temporarily imported goods for manufacturing, assembly or repair with the intention of subsequently exporting them. The "Maquiladora" regulation was replaced by the Manufacturing, Maquila and Export Service Industry (IMMEX) program in 2006. Enterprises under the Maquiladora regulation were exempt from the payment of duties and taxes if their finished products were sold abroad. The regulation began in the mid-1960s with the Policy for the Industrialization of the Northern Border and the purposes were promoting Foreign Direct Investment (FDI), developing the manufacturing industry and creating employment.

Enterprises admitted to the Maquiladora Industry Program spread across Mexico, with the majority located in the north of Mexico, where they took advantage of the proximity of the U.S. The Mexican authorities determined which goods in terms of their Harmonized System (HS) codes could be imported and exported. Any change in the registered and approved items was reported to the authorities for re-approval under new HS codes. Goods produced by the "Maquiladora" industry could leave Mexico without any restriction on their destination. It was assumed that all goods temporarily imported by the "Maquiladora" enterprises were goods for processing. These enterprises were delivering manufacturing services on inputs owned by others. Change of ownership was only recognized when the enterprise paid duties and taxes on the imported goods to sell the finished products to the domestic market. These transactions were identified by specific customs records.

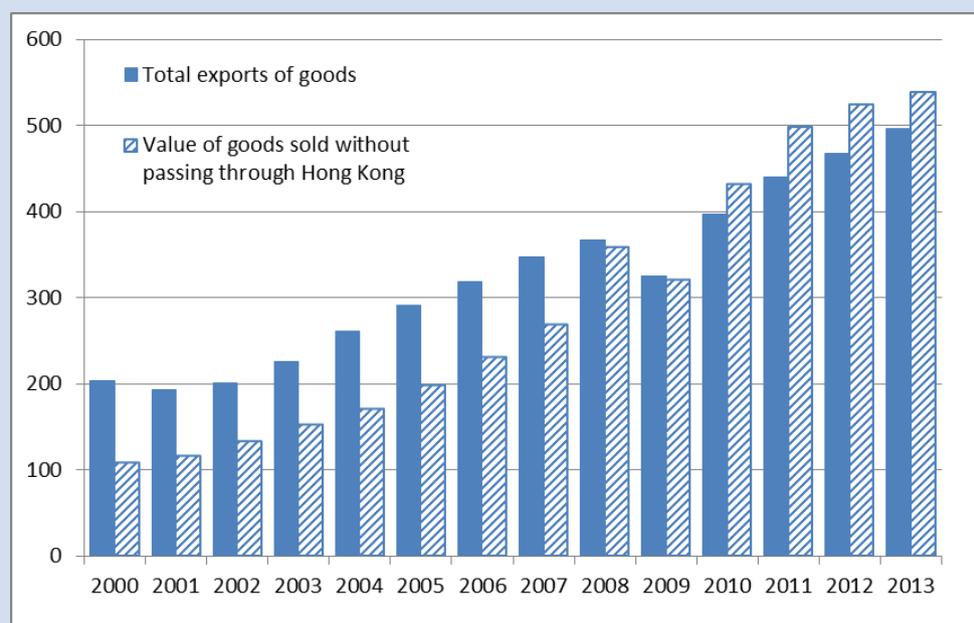
The sources for the statistics on goods for processing until 2006 were the customs records used for the merchandise trade statistics and the monthly survey of the "Maquiladora" Industry carried out by the National Institute of Statistics and Geography (INEGI). It was mandatory for the "Maquiladora" enterprises to respond to the survey that asked about employment and salaries, purchases and consumption of goods and services as well as the value added of exports. The value added of exports corresponded with the processing fee since it included the wages and salaries, domestic expenses and profits. The 2006 statistics showed that there were almost 3,000 "Maquiladora" enterprises employing 1.2 million persons and the total value of processing fees was USD 24 billion. With the start of the IMMEX Program the customs records changed. As a result there was no longer information available to distinguish the goods for processing and calculate the manufacturing services on inputs owned by others because the IMMEX Program involves different kind of enterprises, production processes and foreign trade transactions. This is why INEGI started collecting statistics for this new group of enterprises on merchandise trade by enterprise characteristics (TEC), including a linkage of customs records to obtain information on export market relationships, with a key focus on goods sent to Mexico for processing.

Country case study 5.4**Measuring trade in goods and services on a change of ownership basis: the example of China/Hong Kong SAR**

China/Hong Kong SAR applies the change in ownership principle in compiling statistics on goods sent abroad for processing and merchanting since 2012. Experiences and challenges in measuring international trade in line with the 2008 SNA and BPM6 recommendations are outlined in this case study.

Hong Kong is one of the most externally oriented economies in the world. Trading activities related to goods sent abroad for processing and merchanting play a vital role in the external trade of Hong Kong. As early as in the 1980s, many manufacturing companies in Hong Kong started to relocate their production processes to Mainland China to take advantage of the geographical proximity and lower production cost there. Raw materials and semi-manufactures are transported to factories in Mainland China for processing and the processed goods are returned to Hong Kong for local consumption or for re-export. The share of processing trade in Hong Kong's imports from Mainland China (based on cross-border registration) increased between 1991 and 2000 from 67 to 79 per cent. This share decreased to a level of 38 per cent in 2013.

The majority of the goods sent to Mainland China for processing in the 1990s, was under the arrangement of "processing and assembling" (P&A) in which the raw materials sent to Mainland China for processing and the finished output after processing remained property of Hong Kong-based companies throughout the process, i.e. there was no change of ownership. The processed goods would normally be returned to Hong Kong for subsequent re-exportation to overseas markets. During the 2000s, processing arrangements were gradually shifted to "processing with imported materials" (PIM). Under the PIM arrangement, the ownership of the imported inputs is transferred to the processing units in Mainland China, and the processed goods might not be returned to Hong Kong. As a result of the shift from P&A to PIM arrangement, the volume of processed goods returned to Hong Kong showed only a moderate increase in the 2000s as compared to the 1990s. New data on processing trade under both P&A and PIM arrangements are collected to implement the change of ownership principle. The new data also support analysis of the structural changes from P&A to PIM arrangements at broad industry level.

Value of goods sold without passing through Hong Kong and exports of goods of Hong Kong

While re-imports to Hong Kong still remained the major mode, its share (as a percentage of the value of raw materials/semi-manufactures sent to Mainland China for processing) had somewhat declined in the past decade or so, from 78 per cent in 2000 to 71 per cent in 2012. On the other hand, the share of processed goods exported directly to overseas markets had gradually increased. Parts of these goods are processed under the P&A arrangement, and hence should be recorded as exports of goods of Hong Kong instead of Mainland China under the change of ownership principle. On the other hand, merchanting activities undertaken by Hong Kong companies have prospered since the 2000s. Hong Kong traders engage in a substantial amount of merchanting activities to take advantage of their extensive trading network with buyers and sellers in the global market. The total value of goods sold without passing through Hong Kong amounted to USD 535 billion in 2013, about 5 times the value in 2000. As a result, since 2010 the value of goods without passing through Hong Kong had become higher than the overall value of total exports of goods from Hong Kong.

Companies in Hong Kong typically undertake three types of global production arrangements: outward processing, merchanting and offshore trade activities involving outward processing. Their measurement based on the 2008 SNA and BPM6 principles is further discussed below.

Outward processing

Given the importance of processing trade between Hong Kong and Mainland China, the Census and Statistics Department of Hong Kong has been conducting a Survey on Trade Involving Outward Processing in the Mainland of China (OP Survey) since the late 1980s to capture data on outward processing activities. The OP Survey is conducted on a monthly sample of import/export trade declarations. While basic information regarding the sampled consignments (such as trade type, trade value, commodity type and market) can be collected from trade declarations, the required information on outward processing is obtained by computer-assisted telephone interviews with the establishments concerned. For the purpose of implementing the change of ownership principle, the OP Survey has been enhanced since the second quarter of 2008 to collect additional data on the P&A contracts. Enhancements include collecting additional information on the following breakdowns pertaining to imports from Mainland China which involve outward processing of goods under the P&A arrangement:

- Value of raw materials/semi-manufactured goods sent from Hong Kong to Mainland China
- Value of raw materials / semi-manufactured goods purchased and delivered directly from places other than Hong Kong to Mainland China
- Value of manufacturing services on physical inputs owned by Hong Kong, with the following breakdowns:
 - Processing fees paid by Hong Kong
 - Raw materials/semi-manufactured goods procured directly by Mainland China's processing units

To support the compilation of more detailed trade statistics under the change of ownership principle and the conduct of more in-depth trade analysis, the quarterly sample size of the OP Survey has been enlarged significantly (more than doubled) over the past years. This has enabled the compilation of reliable estimates of the above mentioned additional breakdowns. To meet the timeliness requirement of GDP and balance of payments estimates, preliminary estimates of goods related to outward processing, applying the change of ownership principle, have been produced at an aggregate level, at a shorter time lag, using partial survey results and data modelling.

Merchanting and offshore trade activities involving outward processing

Considering the significance of merchanting activities in Hong Kong's trade in services, the Census and Statistics Department of Hong Kong has been collecting the relevant data via the Annual Survey of Imports and Exports of Services (ASIES) since the 1990s. Data on the sales of goods and cost of goods sold under merchanting are regularly collected to compile the value of merchanting services provided by Hong Kong traders. Offshore trade activities involving outward processing refer to trading activities in which goods are processed under P&A contracts, and subsequently sold to non-residents directly without the goods passing through Hong Kong. Under the previous treatment, the gross margin of offshore trade activities involving outward processing was recorded as trade in services. However, as the goods sold involve actual buying and selling activities (with a change of ownership), the new principle stipulates that sales of such goods should be recorded as trade in goods. The processing fee involved is to be recorded as an import of manufacturing services on physical inputs owned by Hong Kong traders. To meet the data requirements on merchanting arising from the new principle in a timely manner, the Census and Statistics Department of Hong Kong has implemented a new Quarterly Survey of Merchanting and Other Trading Activities (QSMTA) since the first quarter of 2010. However, only aggregate data are collected to minimize response burden. More detailed data, e.g. the value of sales of goods under merchanting by broad commodity group and by country/territory, continue to be collected on an annual basis via the ASIES.

Apart from collecting the value of sales and cost of goods sold under merchanting, the new quarterly survey also provides additional data related to offshore trade activities involving outward processing. This information cannot be otherwise collected from trade declarations or from the OP Survey of which the reporting unit is based on trade declarations, as these goods do not cross the boundary of Hong Kong. The following additional data are collected on offshore trade activities involving outward processing activities via the QSMTA:

- Value of goods sold offshore after processing
- Cost of goods sold offshore after processing, with further breakdowns into:
 - Value of raw materials/semi-manufactured goods sent from Hong Kong to the processing economy
 - Value of raw materials/semi-manufactured goods purchased and delivered directly from places other than Hong Kong to the processing economy

- Value of manufacturing services on physical inputs owned by Hong Kong, with the following breakdowns:
 - Processing fees paid by Hong Kong
 - Raw materials/semi-manufactured goods procured directly by the processing units abroad

On average, about 2000 establishments are selected for enumeration in each survey round of QSMTA, of which 800 are certainty cases. These certainty cases have been identified to be very prominent in terms of trade in services or merchanting receipts, based on the survey returns in previous rounds of ASIES and QSMTA. The coverage of the QSMTA is reviewed on an annual basis to ensure a good representation of establishments engaged in merchanting and trade in services activities in the survey.

Country case study 5.5

The recording of foreign trade in the Czech Republic according to the 2008 SNA principles

The Czech Republic has a small and open economy, which is export dependent. The international orientation of the Czech economy increased significantly after the EU accession, which gave rise to considerable FDI inflows at the beginning of the century. Economic and customs union also led to an implementation of a common VAT system and a harmonized system of data collection on foreign trade. As a result, the valuation of trade flows, based solely on the recording of cross-border movements of goods, overestimates the country's trade balance in comparison with the value added created by residents and evidence obtained from the financial accounts. This shows that in the Czech Republic cross-border movements of goods increasingly diverge from foreign trade as recorded on the basis of a change of ownership between residents and non-residents.

Consequently, the traditional primary data sources on international merchandise trade (Intrastat and Extrastat in EU Countries), which are based on the recording of cross-border movements of goods, must be adjusted or complemented with other data sources in order to estimate foreign trade in the national accounts of the Czech Republic. In 2010, a new concept of foreign trade was introduced by the Czech Statistical Office, labelled as the "national concept" to distinguish it from the "cross-border concept" that is based purely on cross-border movements. Since then, the national concept has been used as a main foreign trade data input for national accounts and balance of payments instead of the cross-border concept. Since 2014, the national concept has been published monthly as the main macro-economic indicator on foreign trade in the Czech Republic.

Moreover, there are adjustments conducted in national accounts and balance of payments in order to follow the 2008 SNA, European system of national and regional accounts 2010 (ESA 2010) and BPM6 principles. This case study explains the main steps needed to move from the cross-border primary data source to the national concept and from the national concept to the "change of ownership" recording of trade required by the 2008 SNA, ESA 2010 and BPM6.

From cross-border concept to national concept of foreign trade

Traditionally IMTS have been based on the cross-border concept, i.e. purely on primary data on physical movements of goods across the borders. However, free movement of goods and free trade within the Single market of the EU creates a serious problem for the compilation of merchandise trade based on cross-border data. In the Single market, any unit is allowed to participate in trade and move goods to any member state. Consequently, a considerable amount of cross-border movements of goods are conducted by non-resident units in the Czech Republic (often with only limited relation to the Czech economy). There are also transactions within the domestic market of the Czech Republic between residents and non-residents, which are not recorded in cross-border merchandise statistics. The national concept takes into account these aspects of the Single market and provides a better approximation of trade between Czech and foreign units. Nonetheless, the national concept must not be confused with export and import in national accounts and balance of payments. There are other adjustments made to the national concept before national accounts and balance of payments aggregates are obtained (see the text below).

The transition from the cross-border concept to the national concept consists of two steps:

- 1) Exclusion of transactions reported by non-residents in regular IMTS data sources, since these transactions cannot be considered exports or imports for the Czech economy.
- 2) Inclusion of transactions by non-residents in the Czech domestic market, since these transactions represent the interaction (real trade) between residents and non-residents.

Transactions reported by residents in regular IMTS data sources remain unchanged and are identical in both concepts (however, there are further adjustments in national accounts and balance of payments, see the text below).

Step 1 - Exclusion: The cross-border transaction reported by non-residents in regular IMTS cannot be considered exports or imports for the Czech economy since either:

- a) The goods crossing the borders did not result from trade between a resident and non-resident unit (so-called quasi-transit trade), or;
- b) The goods crossing the borders resulted from trade in the domestic market between resident and non-resident units but were purchased at considerably different prices than reported at the borders (the trade in the domestic market is considered export and import – see step 2).

Quasi-transit trade is usually associated with the import of goods by non-residents into the reporting economy from a non-EU country (data collected by Extrastat), which is followed by the subsequent export of goods into another EU country (data collected by Intrastat). The same phenomenon can also occur for exports. This phenomenon mainly affects countries at the EU borders. However, quasi-transit trade may occur also within the EU and have analogous impact on the estimate of exports and imports in the EU country. These transactions are usually related to warehouse facilities or distribution centres that are primarily intended for the whole European market and not for the Czech domestic market. Due to its convenient location, the territory of the Czech Republic is often used as such a transit (storage) area for goods on the way from the country of production to the final markets. Note the difference between quasi-transit trade and re-export: in case of re-export the owner of the goods is resident.

Quasi-transit trade inflates not only the value of cross-border exports and imports compared to the real exports and imports (followed by financial transactions between residents and non-residents) but also the estimation of cross-border balance of trade. This is because the value of exports related to quasi-transit trade is usually significantly higher than imports due to revaluation of the goods in the warehouses by the owner (non-resident unit) from cost or in-house prices to final customer prices.

The identification of quasi-transit trade in primary data sources (Intrastat, Extrastat) is not easy. In case of Intrastat, there is no specific nature of transaction code to mark these transactions. As for Extrastat, many countries can identify quasi-transit trade by a specific customs procedure. However, it is usually not declared under this customs procedure in the Czech Republic, because it is more convenient for non-resident units to register for VAT in the Czech Republic, declare imports under a free-circulation customs procedure (without any collateral conditions) and subsequently export goods via Intrastat to another EU country. Therefore, in the Czech Republic it is impossible to distinguish goods related to quasi-transit trade from goods that are intended for the Czech market. From a practical point of view, at the moment of physical import of the goods into a warehouse, not even the owner of the goods can usually determine the goods that would be sent to another country or would end up in the domestic market of the Czech Republic.

Nonetheless, the difficulties associated with identification of quasi-transit trade should not prevent the compilation according to the national concept, because by definition all cross-border transactions reported by non-residents are not relevant to the real foreign trade of the Czech Republic. If the good is physically imported into the Czech territory and sold by a non-resident in the Czech domestic market, then it is the trade value of the sale that is taken as import value for the domestic economy (not the value reported by non-residents at the borders, which is often lower than that at sale). Similarly, if the good is purchased by a non-resident unit in the Czech domestic market and subsequently exported from the Czech territory, it is the value of the purchase that has to be considered as export (not the value reported by non-residents at the borders, which is often higher than that at purchase).

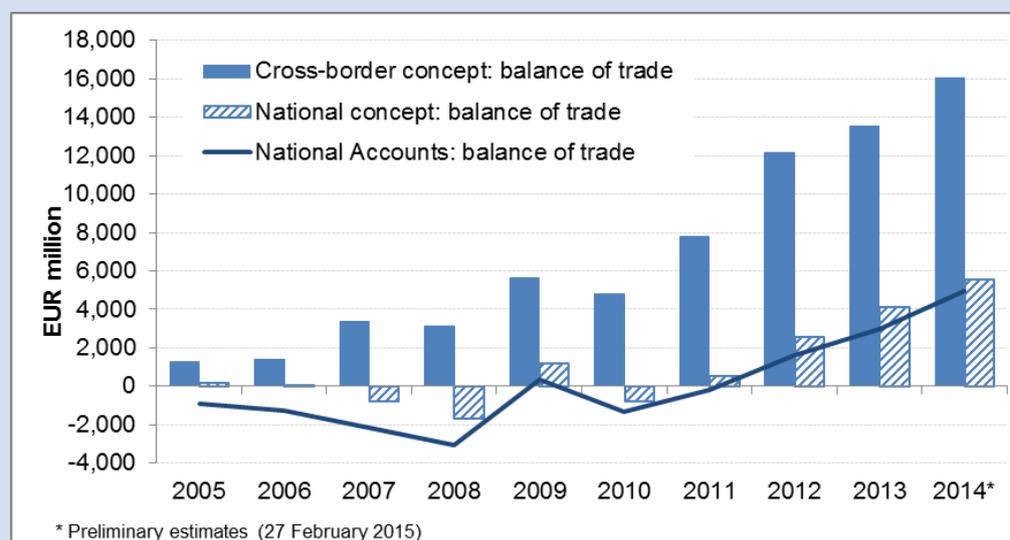
Step 2 – Inclusion: Sales or purchases between non-residents and Czech residents in the Czech domestic market are considered imports and exports for the Czech economy. Thus, contrary to the cross-border concept, the difference between the real trade value (at the moment of change of ownership) and the value reported at the borders by non-residents is not included in exports, imports and the balance of trade following the national concept. The estimation of sales and purchases by non-residents are based on VAT returns submitted by non-residents in the Czech Republic. The estimation of the commodity and territorial breakdown of sales and purchases by non-residents (not provided in VAT returns) are based on cross-border transactions breakdowns and also on industrial surveys, which distinguish between output sold by Czech producers in the domestic market to non-residents (often to a related company) or directly/indirectly across the borders or in the domestic market to residents.

Conclusion of the national concept: The transition from the cross-border concept to the national concept consists of removing shipments of goods as reported by non-residents in Intrastat and Extrastat as they do not represent any change in ownership between residents and non-residents and substituting them with non-residents' purchases or sales in the Czech Republic. This procedure solves both the adjustment of price differences between the value in the Czech domestic market and the value reported at the borders and eliminates quasi-transit trade. The goods sent by residents directly across the borders remain unchanged in both concepts, since it still can be assumed that the cross-border movement marks the change of ownership between residents and non-residents (and if not, it is adjusted in national accounts and balance of payments).

Transactions declared by non-residents represent 25 per cent of exports and more than 18 per cent of imports in the IMTS (in 2014). Most of the surplus in the balance of trade based on cross-border movements was created by non-

residents (75%). Therefore, the difference between the national concept balance and the cross-border IMTS was about -10.5 billion euros (EUR) in 2014. The balance is EUR 5.6 billion according to the national concept instead of EUR 16.0 billion according to the physical movement of goods (see reconciliation table at end of this case study). Moreover, since there are further adjustments conducted in national accounts and balance of payments when compiling statistics on import and export of goods, e.g. for goods sent for processing, the balance in goods in national accounts and balance of payments is usually even lower than the balance in the national concept.

Annual balance of trade (CIF/FOB¹⁸) of the Czech Republic



Measuring goods sent for processing

The national concept of foreign trade is used for the input data for compiling export and import of goods in national accounts and balance of payments. The most significant adjustment in national accounts and balance of payments is the exclusion of the goods sent/received for processing, i.e. cross-border flows of goods without change of ownership, as observed via IMTS data sources. The exclusion of goods sent/received for processing is focused only on transactions reported by residents, because non-resident transactions related to processing (along with all other cross-border non-resident transactions) are already excluded from the national concept. These resident-reported transactions are excluded based on the special nature of transaction code (2-digit in Intrastat and 1-digit in Extrastat).

However, not all nature of transactions codes that are labelled and collected in Intrastat as “goods sent for processing” should be excluded. For example, there is a special nature of transaction code: goods sent abroad for processing without goods returning back, because the goods are sold abroad. In this case the good is not excluded from export (with a minor adjustment in value of goods to take into account the processing services received). Since the nature of transactions can be misreported (especially after processing) in Intrastat, more detailed control procedures were established in the system of data collection by the Department of Foreign Trade Statistics.

With regard to processing services, the difference between goods crossing the borders before and after processing cannot serve at a macro-economic level as a proxy for processing fees, because there are services provided/received without goods crossing the borders. Therefore, since 2013, processing fees are surveyed quarterly in the statistical survey on import and export of services in 14 commodity groups based on the Czech version of the Classification of Products by Activities (CPA). For annual revisions conducted during the balancing of the supply-use table, an annual industrial survey with a commodity breakdown according to Classification of manufactured goods in the European Community (PRODCOM) groupings is used in order to obtain the overall value of export of processing services (i.e., inward processing).

Measuring merchanting

Merchanting is another important adjustment in national accounts and balance of payments compilation. Traditional merchanting is observed via the statistical survey of import and export of services, in which the values of goods purchased and sold abroad by residents are surveyed (the resident is a trader). As required, merchanting is recorded as net export of goods.

¹⁸ Imports including cost, insurance and freight (CIF) adjusted to free on board (FOB) value.

Further, the so-called inverse merchanting is recorded in the Czech national accounts and balance of payments. Inverse merchanting in the Czech Republic was discovered when VAT data, and non-residents' VAT returns in particular, were examined in full detail. Inverse merchanting occurs when non-residents buy and sell goods solely within the domestic market of the Czech Republic without goods leaving the Czech territory (the non-resident is a trader, and residents are both buyers and sellers). As there is a change of ownership between residents and non-residents, the transactions must be considered either export or import of goods, even without any recording of cross border movements of the goods. The trade margin obtained by these non-residents may cause a discrepancy between resources and the use side of the supply-use tables if not properly observed. It is conceptually analogous to traditional merchanting from the resident point of view. In the Czech Republic this inverse merchanting is, therefore, recorded under net import of goods.

Other methodical adjustments for exhaustiveness in national accounts and balance of payments

Following the ultimate change of ownership principle and exhaustiveness required by ESA 2010, 2008 SNA and BPM6, there are other adjustments carried out in the Czech national accounts and balance of payments, such as illegal activities, exclusion of other cross-border flows without a change in ownership (e.g. operating lease, other lease assets), supplies below threshold, exclusion of duplicates (between goods and services) and goods purchased at ports and borders.

Reconciliation table for foreign trade in goods – from cross-border data to national accounts and balance of payments aggregates, preliminary estimates for year 2014 (in EUR million)

	<i>Export of goods</i>	<i>Import of goods</i>	<i>Balance</i>
Cross-border foreign trade (IMTS) - CIF/FOB	131452	115381	16071
of which: Non-residents cross-border transactions (-)	-33156	-21128	-12028
Purchases by non-residents from residents in the domestic market	16240	.	.
Sales by non-residents to residents in the domestic market	.	14724	.
National concept of foreign trade	114535	108977	5558
Adjustments in NA/BoP			
Exclusion of goods sent/received for processing (-)	-4186	-3706	-480
Traditional merchanting (residents)	279	.	.
Negative merchanting (non-residents)	.	399	.
Other methodical adjustments for exhaustiveness*	-16	113	-129
Foreign trade in NA/BoP - CIF/FOB	110612	105783	4829

* For example, supplies below threshold, illegal activities, exclusion of duplicities (between services and goods), operating lease

Country case study 5.6

The Philippine experience on improving the methodology on electronics import statistics

Questions on the reliability and accuracy of published imports and exports data have been raised in the Philippines. Although an improvement in the trade balance has been observed, with electronics industry as the main driver of exports growth, there was no corresponding increase in the respective materials. Further, a comparative study showed that reported material value of electronic exports exceeded imported raw materials in spite of the fact that electronics are highly import-dependent. These observations led to the expectation that there was underestimation of imports, specifically on consigned electronic goods. Hence, this study focuses on improving the capture and valuation of consigned electronics in the Philippines.

In the Philippines, exports and imports of electronics are grouped into nine components, namely: (1) components/devices of semiconductors; (2) electronic data processing; (3) office equipment; (4) consumer electronics; (5) telecommunication; (6) communication/radar; (7) control instrumentation; (8) medical/industrial instrumentation and (9) automotive electronics.

In 2011, Philippine exports of electronics accounted for 61 per cent, 55 per cent in 2012 and 52 per cent in 2013 vis-à-vis the country's total exports. On the other hand, electronic imports accounted for 32 per cent, 35 per cent and 30 per cent of total imports in 2011, 2012 and 2013, respectively.

To address the issue of reliability and accuracy of published exports and imports data, a task force on import statistics was created by the Central Bank of the Philippines (BSP). This task force was composed of representatives from the BSP, National Economic and Development Authority (NEDA), National Statistical Coordination Board (NSCB) and the NSI. On the basis of the joint report presented by the task force, the NSCB Executive Board directed the NSI to revise the time series of imports data to account for the underestimation and to put recent developments in the balance of payments and external accounts into proper perspective, including the estimation of exports and imports of goods for the national accounts.

The task force through the BSP and NSI conducted a joint Survey of Imported Raw Materials with the top 15 electronic companies as respondents. Based on the results of the survey, the task force came up with a proposed methodology for the revision of imports data which was presented and approved by the NSCB Executive Board. Using this approved methodology and responses of top 10 sample companies in a subsequent survey, the NSI computed and released the revised import data for 2002 together with revised monthly imports data for 2000 and 2001.

The task force on Import Statistics continued to find ways to further improve the valuation methodology and continuously informed the Board on its activities, particularly, the provision of instructions for importers and exporters on the proper filling out of import/export declaration forms and the importance of providing correct information. In 2004, the task force presented its recommendations to the NSCB Executive Board. One recommendation was the creation of the Inter-Agency Committee on Trade Statistics (IAC-TRS), which continued the work of the task force by exploring means to further improve the valuation methodology. While the Survey of Imported Raw Materials was conducted to correct imports, the underestimation was only partially addressed as the NSI limited the correction to the sampled companies only. The survey suffered from poor quality of responses from some companies such that the survey data could not be used to correct subsequent reports. Further, having a joint survey on a regular basis is not sustainable due to budget constraints and response burden. As the underestimation persisted, the IAC-TRS continued to consult with the Semi-conductors and Electronics Industries of the Philippines, Inc. (SEIPI) and other electronics companies.

A series of briefings on the Automated Export Data Documentation System (AEDS) of the Bureau of Customs (BOC) have likewise been conducted by the IAC-TRS to provide directions on the proper filling out of the customs declaration forms for the purpose of correcting under/over coverage of electronics exports. The AEDS training also provided an insight into the electronic industry as a whole and strengthened the initial findings in the previously held dialogues with the electronics industry. Some of the major findings were:

- The industry functioned largely under consigned arrangement/outsourcing in which manufacturing is limited to mostly assembly work; and therefore, local value added is relatively low. The value added, or the amount that local companies charged to the foreign companies for assembly work, enters the local company books as its revenue. Note that free on board (FOB) values of exports and imports under consigned arrangements are not entered in the books of the local companies.
- Companies do not know the exact value of received shipments and have no urgent need to know since, as previously mentioned, these are off balance sheet items. In most cases, import values are dictated by the foreign companies whose only use for the companies is to comply with customs declaration.
- For big companies, declaration is done by brokers and forwarders who would not be in a position to report the true value of imports.
- Moreover, since consigned imports are not subject to duty, they are not examined thoroughly by customs and, therefore, any error in valuation would not be corrected.

Given the above observations, it is unlikely that the present monitoring system that is purely dependent on documents, Import Entry and Internal Revenue Declaration (IEIRD) collected by the NSI from BOC, will give a good measure of the true value of imports. Hence, the IAC-TRS proposed another methodology to estimate the true measure of imports of consigned electronics using the material value of electronic exports derived from the Export Declarations (ED) instead of the FOB import figures from the IEIRD of consigned electronics exports.

The methodology proposed by the IAC-TRS involved the use of the information compiled from the ED and AEDS collected by the NSI from the BOC. One limitation in using the BOC forms is the reliability of the information contained therein. There are cases where the material value content of exports is not filled out. The mandatory filling out of this information is, thus, a necessary step to have more reliable information. Detailed steps are as follows:

- 1) Generate the top 25 electronic exporters for the year in terms of their FOB value of exports. The top 25 comprise 85 to 87 per cent of the total FOB value of electronic exports.
- 2) Categorize these electronic exporters according to how they acquire raw materials, that is, whether the raw materials are acquired on a consignment basis (consigned exporters), or directly imported (direct exporters) or both (mixed exporters).
- 3) Generate a file for consigned exporters consisting of their FOB value of exports (X) and the value of raw materials (material value) reported in the ED and the FOB value of imports (M) from IEIRD.
- 4) Validate the value of raw materials (MV) with the import (M) figures:
 - If the material value (MV) of the exporter is greater than imports (M), replace the value of imports with its material value to get the revised import (M')

- If the material value (MV) is less than imports (M), retain the value of imports
- 5) Compute the value added ratio (VAR) using the revised import, M' that is, $VAR = (X - M')/X$.
 - 6) If the computed value added of a company is greater than 50 per cent, exclude that particular company from the group of consigned exporters for which the value added ratio (VAR) will be generated.
 - 7) Sum the exports (X) and the imports (M') for the remaining companies in the group and compute the value added ratio.
 - 8) Apply the computed value added ratio to the total electronics export to get the revised electronic imports for the year. In formula, $M'' = X_t - VAR_{t-1} * X_t$ Where: X_t = total electronic exports at time t, VAR_{t-1} = value added ratio for the sample consigned exporters for the previous period and M'' = revised imports for electronics sector.
 - 9) Compute the difference between the total revised electronic imports (M'') and total electronic imports (M).
 - 10) Distribute the computed difference (9) proportionately to all consigned imports for the following commodities: Philippine Standard Commodity Classification (PSCC) 9310111 – Dice of any material, imported on consignment basis for the manufacture of semi-conductor devices; PSCC 9310112 – Molding compounds, imported on consignment basis for the manufacture of semi-conductor devices; PSCC 9310113 – Frames of any material, imported on consignment basis for the manufacture of semi-conductor devices; PSCC 9310114 – Gold wire, imported on consignment basis for the manufacture of semi-conductor devices and PSCC 9310119 – Other materials and accessories imported on consignment basis for the manufacture of semi-conductor devices.

From this research the following conclusions and recommendations were drawn:

- 1) Adopt the proposed interim methodology until improved and more viable valuation methodology has been developed.
- 2) Starting 2005, compute the preliminary monthly adjustment for import using the computed monthly value added ratio based on next month's export figure and current import figure. Adjustment on import figures will have a lag of one month. This procedure is based on the assumption that the imports for the current month will result in exports for the next month.
- 3) NSI and BOC to ensure strict compliance of the mandatory filling out of Box 44 of the AEDS form by concerned companies.
- 4) The IAC-TRS to continue the work for other commodities e.g. exports and imports of garments, etc. with the improved methodology done for electronics as a pilot exercise to serve as basis for improving the capture/valuation of other exports/imports of commodities.

Merchanting (Case B)

5.66 The characteristics of merchanting are explained in Chapter 2. A trader engaged in merchanting purchases goods from a foreign supplier and sells them subsequently to customers abroad. The goods do not physically enter the domestic territory of the trader, and the trader does not carry out substantial transformation of goods.

5.67 According to the 1993 SNA and Balance of Payments Manual, fifth edition (BPM5), the difference between the sale and purchase of goods under merchanting were recorded as merchanting services. The goods subject to merchanting remained unrecorded as imports and exports, and this was acknowledged in BPM5 as an exception to the change in ownership principle. The 2008 SNA and BPM6 are brought in line with this principle and the net export of goods under merchanting is shown in the accounts of

the country in which the merchant is resident. These new accounting conventions do not alter the production account of the merchant as its output remains to reflect the trade margin.

5.68 The differences in recording are highlighted in Table 5.4 based on the athletic shoe example as introduced in Chapter 2. The key aspect of this change is that the transactions in goods are explicitly recorded and the trade service provided by the merchant is added to the value of the good sold under merchanting. Moving from the 1993 SNA (or BPM5) to the 2008 SNA (BPM6) basically resembles a shift from the recording of merchanting in terms of services to its recording in terms of goods. Distribution services are not measured independently within the balance of payments services account, because the value of the trade service is included in the value of the sale of the good.

Table 5.4
Merchanting, international transactions according to 1993 and 2008 SNA

	1993 SNA	2008 SNA
Exports	25	25
Goods	0	25
Net exports of goods under merchanting	0	25
Goods acquired under merchanting	0	-85
Goods sold under merchanting	0	110
Services	25	0
Imports	0	0

5.69 With regard to merchanting the following data items, and corresponding data adjustments, are required:

- a) Estimate of the trade service of the merchant;
- b) Estimate of the imports (or negative exports) and exports under merchanting;
- c) Estimate of (changes in) inventories held abroad.

5.70 Each of these items is further discussed below.

Identification of merchanting

5.71 As trade services related to merchanting are not necessarily identified as such, additional analysis is needed to identify cases of merchanting, also because merchanting related imports (or negative exports) and exports remain unobserved in merchandise trade statistics. The kind of investigations required are similar to those developed by NSIs to identify factoryless goods producers (FGP). These are later on discussed in this chapter. The following examinations could be carried out to detect merchanting activities:

- a) Merchanting related transactions may be observed within the scope of business surveys, particularly the surveys for the wholesale industry, but this would require questionnaire adjustments as noted below.
- b) Data comparisons and analysis of different data sources could be conducted, preferably on the basis of single company identification numbers, particularly (but not necessarily only) in the Trade Section G, that carry out international transactions (as far as observed).
- c) Detailed banking data on transactions in foreign currency classified as exports of goods could be compared with customs data on exports for individual enterprises. Whenever banking data on exports of goods for an enterprise are significantly higher than customs data, it may be suspected that

there is a case of merchanting and further data analysis (or surveying) is recommended.

- d) Alternatively, a method used to find cases of merchanting is the comparison of data for enterprises covered in business surveys with customs data. Business surveys may help identify trade related transactions with foreign suppliers or customers.

a) Estimate of the trade service of the merchant

5.72 Information on trade margins is typically obtained from business surveys, though there may, or may not, be a split for merchanting versus other sales. Merchants will usually be classified under Section G (Wholesale and retail trade; repair of motor vehicles and motorcycles) of ISIC Rev.4. It should be noted that enterprises in other industry branches could be engaged in merchanting as well.

5.73 The business surveys for companies in the wholesale and retail trade section are usually designed to measure the turnover from distributive trade, as well as purchases of goods which are subject to distributive trade. This information will allow compilers to estimate the trade margins of wholesale and retail trade as the difference between trade related purchases and sales (turnover).

5.74 In the production account, the output of distributive trade (the trade margin) is recorded as all sales made by the unit irrespective of the location of where the good is purchased. Supplementary questions in the survey, following the structure proposed below, can provide information on the merchanting portion of trade related activities:

- a) Goods purchased abroad, which are sold:
 - i. domestically;
 - ii. abroad.
- b) Goods sold abroad, which were purchased:
 - i. domestically;
 - ii. abroad.
- c) Changes in inventories as a result of timing differences between (a) and (b).

5.75 The merchanting related purchases of goods are represented by item (a.ii.) while merchanting related sales are represented by item (b.ii.). The difference between the two may include the trade margin but also possible holding gains and losses resulting from revaluations of goods subject to merchanting which should be removed from the value of trade services.

5.76 Another source of information on merchanting services may be the international trade in services statistics. The MSITS 2010 indicates that valuing of the service provided by commission agents, wholesalers and retailers (distribution services) would present a particularly useful complement to services statistics covered in the balance of payments. It is possible that

some of the revenues from merchanting are already observed in the trade in services statistics. Estimating and providing this information on a complementary

basis, excluding holding gains and losses, would enable a more complete analysis of the international supply of services.

Country case study 5.7

Surveys used in the United States to identify merchanting and inventories held abroad

In the U.S. a combination of information collected on various surveys is needed to appropriately record the transactions related to merchanting activities and the corresponding changes in inventories held abroad. Two separate agencies are responsible for the collection of the survey data. The Bureau of Economic Analysis (BEA) conducts mandatory surveys under a law known as the International Investment and Trade in Services Survey Act. Among its provisions, this act requires the periodic collection of data on international trade in services and direct-investment-related activities. The United States Census Bureau conducts the Annual Wholesale Trade Survey (AWTS) and the Annual Retail Trade Survey (ARTS) which collects information on sales (turnover) and inventories.

The BEA conducts the Benchmark Survey of Transactions in Selected Services and Intellectual Property Products with Foreign Persons (BE-120) to track U.S. imports and exports of services and intellectual property products (IPP). A U.S. corporation reports transactions for the fully consolidated U.S. domestic enterprise which excludes foreign branches and other foreign affiliates.

BPM6 recommends classifying merchanting as a component of trade in goods under the new category “net exports of goods under merchanting,” and presenting the gross transactions in goods associated with merchanting. The BEA currently collects net receipts from merchanting on its surveys of selected services and records them as a component of “other” private services. BEA’s current source data on goods do not cover gross transactions associated with merchanting because these goods do not cross the U.S. customs frontier. Therefore, BEA has added questions to its 2011 benchmark survey to identify the purchases and subsequent resales of goods under merchanting.

► Schedule F — ADDITIONAL REPORTING OF TRANSACTIONS (WITH FOREIGN PERSONS) IN MERCHANTING SERVICES

1. Did you report receipts for merchanting services (transaction code 22) on Schedule A?

- F1001¹ 1 Yes
 2 No – Schedule F is complete.

2. Are you able to report the value of sales and purchases of the goods sold under the merchanting transactions you reported on Schedule A (Note: Sales of merchanting services are equal to the **difference** between your cost and the resale price of goods (such as crude oil, grain, and other commodities) that are both purchased and resold abroad; that is, the goods are neither imported to, nor exported from, the United States and they do not undergo significant processing during the time between when they are purchased and resold.)

- F1002¹ 1 Yes – Go to question 3.
 2 No – Schedule F is complete.

3. (Voluntary) Enter the value of sales and purchases of the goods sold under the merchanting transactions you reported on Schedule A.

		Thousands of U.S. dollars		
F1003	1	Sales	2	Purchases
		\$		\$

4. The sales and purchases recorded in Question 3 were (check the appropriate box):

- F1004¹ 1 Based on accounting records.
 2 Estimated by persons knowledgeable regarding these transactions.

After contacting potential survey respondents, BEA determined that some respondents may have difficulty identifying these transactions in their accounting records and accurately reporting them. Therefore, BEA has requested information on the underlying goods transactions on a voluntary basis. BEA will evaluate the survey responses to determine if they can be used to develop estimates for these transactions.

The reporting unit on the Census Bureau's AWTS or ARTS survey cover all wholesale (or retail) establishments in the U.S. reporting payroll under a single employer identification number (EIN). The EIN is a Federal Tax Identification Number and is used to identify a business entity. The end-of-year inventories and inventories held outside the U.S. are collected by industry and not by type of product. Below is an excerpt from the annual wholesale trade survey for the questions specific to inventories. The same questions appear on the ARTS survey.

The questions do not specifically target goods bought and sold under a merchanting arrangements. The data collected could reflect timing differences of when a good is imported into the U.S. and when the change in ownership occurs. However, the data could be used as an indication of the amount of inventories held abroad under merchanting arrangements. The highest percentage of inventories held abroad for merchant wholesalers excluding manufacturing sales branch offices was in the petroleum and products industry, an industry known for its merchanting type arrangements. The results also show that in the year 2011 inventories held abroad by merchant wholesalers represent 4 per cent of total inventories.

7 VALUE OF INVENTORIES

INCLUDE

- All inventories of products covered by this report, including auxiliary locations (such as warehouses, garages, and central administrative offices) servicing these establishments, regardless of where held
- Inventory held in Foreign Trade Zones or in bond warehouses in the United States
- Report at cost or market value as of December 31 (or the end of the period for which you are reporting)

EXCLUDE

- Items such as fixtures, equipment, and supplies not held for resale
- Products owned by others that are being held on consignment

A. Did this EIN own inventories, regardless of where held, at the end of 2012 (or the end of the period for which you are reporting)?

- Yes
- No - Go to **8** on the next page

B. What was the value of inventories?

Mark "X" if None

- 1. Total inventories (if applicable, before Last-in, First-out (LIFO) adjustment)**
- 2. LIFO reserve (if applicable)**
- 3. Book value of inventories**
7B1 minus 7B2.

2012			
\$ Bil.	Mil.	Thou.	Dol.

C. Were inventories reported as of December 31?

- Yes - Go to **7E**
- No

2012		
Month	Day	Year

D. If not December 31, inventories were reported as of what date?

E. Were any of the inventories reported in 7B1 stored outside, or en route to, the 50 states and the District of Columbia in 2012?

- Yes
- No - Go to **8**

F. What was the value of the inventories stored outside, or en route to, the 50 states and the District of Columbia in 2012?
Exclude inventory held in Foreign Trade Zones or in bond warehouses in the U.S.

2012			
\$ Bil.	Mil.	Thou.	Dol.

8 INVENTORY VALUATION METHOD

A. Were any of the inventories reported in 7B1 subject to the LIFO valuation method?

- Yes
- No - Go to **9** on the next page

B. How much of the inventory reported in 7B1 was subject to:

Mark "X" if None

- 1. LIFO valuation method before adjustment**
- 2. Any other valuation method**
- 3. Verify Total**
Sum of 8B1 and 8B2. Total must equal 7B1.

2012			
\$ Bil.	Mil.	Thou.	Dol.

Country case study 5.8

Implementation of merchanting in the national accounts of the Republic of Korea

Under the 1993 SNA, merchanting was calculated as the value of the goods sold less the cost of purchasing the same goods and at that point in time and was classified in wholesale services. The 2008 SNA recommends that goods under merchanting should be recorded as negative exports on acquisition and positive exports on disposal.

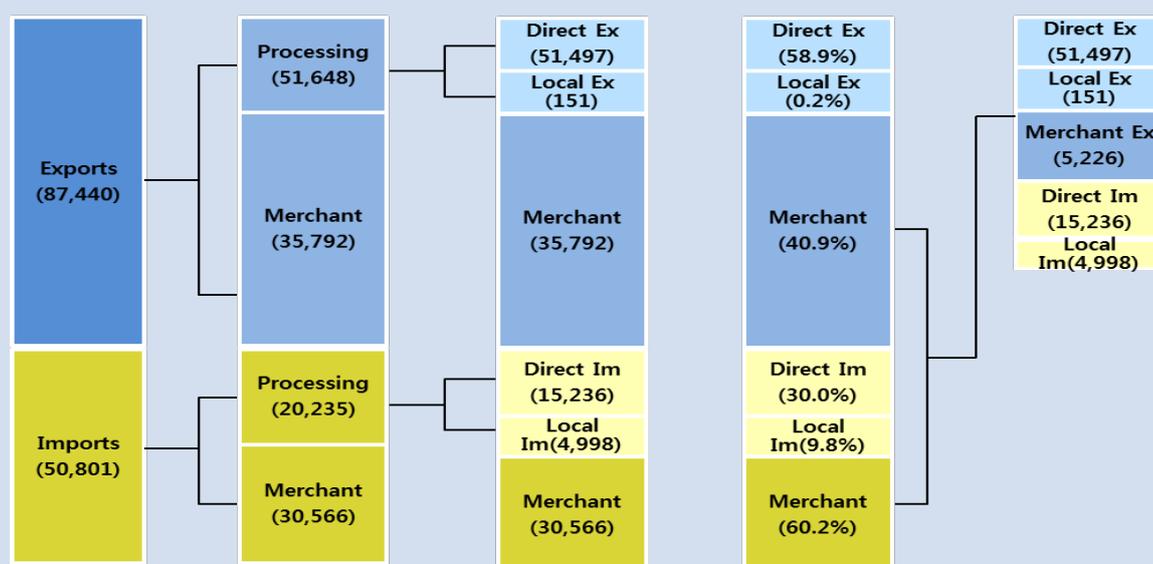
The following steps were taken by the Bank of Korea to measure merchanting according to the 2008 SNA and BPM6 principles. As a first step the total amount of processing and merchanting trade was estimated by determining the difference between International Transactions Reporting System in the Republic of Korea (FEIS) data and customs data by using the following identities:

Exports in FEIS - Exports in customs data – Other exports except customs, processing and merchanting trade = Total Exports of Processing and Merchanting

Imports in FEIS - Imports in customs data – Other imports except customs, processing and merchanting trade = Total Imports of Processing and Merchanting

The second step represents dividing the total amount of processing and merchanting into trade for processing and merchanting using the survey on Processing Activities. As a third step the product composition of goods subject to merchanting is identified by using a survey on Merchanting Activities. Key in this analysis is the reconciliation of valuation methods between the two used sources, FEIS versus customs data, and making the proper adjustments for time lags.

Composition of processing and merchanting trade (2010, USD million)



For identifying the processing related commodity flows the following steps are taken:

- 1) Identify the known information from customs data.
- 2) Link the goods for processing with returned goods.
- 3) Survey and Estimate.
- 4) Make imports transaction table for outward processing.

For estimating merchanting activities, the following analytical steps are made:

- 1) Estimate total acquisition and disposal by Merchanting Activities
- 2) Survey merchanting activities by industries:
 - select items subject to merchanting;
 - acquisition and disposal of each item;
 - major origin and destination countries.
- 3) Estimate margin rate of each item.
- 4) Make exports vector for Merchanting.

Looking at the goods subject to merchanting in the Republic of Korea (reference year 2010), 89.3 per cent consists of Electronic and electrical products, Petroleum and coal products (4.6%), Chemical products (2.7%) Textile products, (1.3%) and Others (2.0%).

b) Measuring net exports of goods under merchandising

5.77 One could say that, compared to industrial processing, merchandising leads to the opposite data situation. Industrial processing results in flows of goods in merchandise trade statistics which should not be recorded in the balance of payments. Merchandising leads to net exports (exports minus imports) which remain unobserved in merchandise trade statistics. This means that supplementary sources are needed for their observation.

5.78 As previously discussed, the transactions of goods under merchandising could either be observed by making corresponding adjustments in the business statistics of wholesale traders, or in the international trade in services statistics. The minimum data requirement is to measure at least the trade margin obtained from merchandising. Without information on product transactions, the corresponding product values (purchases and sales) could roughly be derived from the trade service value by making assumptions. However, details on the specific commodity categories will remain unknown. Information on the trade service alone would probably provide a reasonable approximation of the contribution of merchandising to the trade balance. This approximation of imports and exports is obviously a

second best alternative that should only be used when the data collection cannot be expanded in the process of moving from BPM5 to BPM6.

c) Estimate (changes in) inventories held abroad

5.79 Country case study 5.5 shows that inventories held abroad as part of merchandising should be observed by making the appropriate arrangements in the business surveys of wholesale traders. In connection with information on purchases and sales of goods under merchandising, the business survey may be able to provide a comprehensive view of merchandising activities and may support making the distinction between trade services and revaluations of related inventories.

Data validation

5.80 Cases of merchandising which significantly contribute to (trade related) domestic turnover, or are significant from a balance of trade perspective, may require an individual approach on the basis of all available information that is collected for these companies. This may lead to data improvements and filling in the missing bits of the entire merchandising arrangement. An example of such a custom-made analysis is illustrated in the following country case study of Kyrgyzstan.

**Country case study 5.9
Merchandising in Kyrgyzstan**

Like most countries in the world, Kyrgyzstan is caught up by the process of globalization. International flows of goods, services, capital, labour and income, affect the national economy and -(pose challenges for the statistical measurement). The *National Statistical Committee of the Kyrgyz Republic* (NSC) is responsible for detecting new phenomena accurately and developing measurement solutions.

Regular statistical reporting does not distinctly show the effects of globalization in the activity of national enterprises. In order to detect aspects of global production, NSC developed an analytical tool and put into practice in 2010. This tool deals mostly with the data of wholesale trade enterprises. While processing regular statistical reports, an automatic comparison is conducted regarding domestic wholesale trade volumes, volumes of production and exports and imports by products. These quasi balances provide current estimations at the level of product groups. The tool enabled NSC to discover some important facts.

There are two large resident enterprises in Kyrgyzstan which occupy a significant place in the national economy. The revenues of these enterprises in 2011 were equal to 0.7 and 0.4 per cent of GDP respectively. These enterprises are monitored through several indicators within regular statistical reporting: gross income (trade margin), goods for resale, expenditures on heat supply and electricity, railway transport, communication, rent, payments of interest on credit, compensation of employees, travel allowances and other expenditures. These indicators reflect the domestic production activities carried out by these companies as recorded in the Kyrgyz national accounts.

Most of these enterprises' activities consist of wholesale trade in oil products. A specific feature is that these enterprises buy oil products in the Russian Federation which are sold in Kazakhstan. The goods (oil products) are being shipped from the Russian Federation to Kazakhstan directly without entering the economic territory of Kyrgyzstan. This trade in oil products remains unrecorded in the customs statistics and, consequently, does not show up in the foreign trade statistics of Kyrgyzstan.

At the same time, the sales of these oil products are reported by these enterprises as wholesale turnover of domestic trade. Although this turnover is correctly assigned to these two companies, it does not relate to domestic trade de-facto as the oil products do not enter the national territory. Taking into account that Kyrgyzstan is a country with a small market for oil products, the volumes under consideration are quite important regarding the scale of the national economy. The resulting misbalance between the data on trade in the domestic and foreign economies, intermediate consumption and all other data in the input-output framework required reconsideration.

The Interstate Statistical Committee of the Commonwealth of Independent States (CIS-STAT) experts together with the NSC statisticians considered the question of how the activity of the described enterprises should be reflected in the compilation of Kyrgyz national accounts. For the recognized clear cases of merchanting, the corresponding recommendations in the 2008 SNA (14.79, 26.21) and BPM6 (10.41-10.49), as well as the recommendations in the Guide "The Impact of Globalization on National Accounts" (6.22-6.23) were applied. This means that the acquisition of goods by these two merchants is shown as a negative export of goods under merchanting while the subsequent sales of the goods is shown as positive export of goods under merchanting. The difference between sales and purchases of merchanting goods represents the "net exports of goods under merchanting" which equals the produced trade services by these two merchants in Kyrgyzstan.

Factoryless goods manufacturing (Case C)

5.81 Under current guidelines FGPs are considered as a special case of merchants. However, due to their specific characteristics and the more active role they take in the manufacturing stages of production it is recommended that FGPs are separately identified within trade classes (see the detailed discussion on the classification and recording the transactions of FGPs in Chapter 2). This separate identification will allow further analysis of the characteristics of FGPs and will inform future revision of international standards to include FGPs in respective manufacturing classes.

5.82 If FGPs are classified in trade, their recording will follow the merchanting arrangements and data items as introduced in the previous section on merchanting are needed. The suggested accounting adjustments when FGPs will be classified to manufacturing are presented in Chapter 2 (paragraph 2.69 and further).

5.83 As mentioned above the first step in advancing the research on FGPs is their separate identification within trade. The following paragraphs propose criteria that are used to detect such companies. It has to be noted that although according to current standards FGPs are classified under trade, the evidence from countries shows that FGPs may be also found also in manufacturing, commercial services, research or other activities.

Identifying FGPs

5.84 The key challenge is identifying the nature of FGPs' activities and to distinguish them from trading as it is likely that most FGPs will be classified under trade which is according to the current international recommendations. Although output and production will differ substantially, business surveys may not provide the necessary evidence needed to distinguish FGPs from distributors found in the same ISIC-class. Both types of companies will report turnover from sales of manufactured goods combined with purchases of (the same) manufactured goods. Details on production costs will show that both types of firms are not engaged in the physical transformation of goods.

5.85 The distinction between both types of companies is much better described in terms of their

role in the (global) production arrangement, or in other words, the business functions they carry out. Distributors are mainly responsible for bringing manufactured goods from producers to consumers. FGPs take part in the manufacturing process of the goods they buy and sell by delivering the blueprints of goods and managing the production chain. From a measurement perspective it is unfortunate that all these functions, distribution, product development and chain management may be combined within one enterprise. This obviously complicates the picture and the precise classification of companies engaged in this mixture of business functions.

5.86 The first signals helping to identify a FGP is when seemingly traders appear to be huge investors in IPPs and are generating above average trade margins. These high trade margins encapsulate the returns to IPP investment. A complicating factor is of course that such companies may not be included in the sample of research and development (R&D) surveys, when these companies are classified as traders. In other words, two important indicators mark the presence of an FGP. Firstly, a trade margin that encapsulates the value of IPP related services will be substantially larger than that of a pure trader. Secondly, substantive ownership of IPPs, and R&D in particular, does not match very well with purely trade related activities, and this may indicate the presence of an FGP.

5.87 FGPs will employ staff with above average wages per hour including managers, researchers and product designers. Information on the educational attainment of employees obtained from labour surveys may provide further evidence. So, a supplementary step is analysing the quality aspects of labour input. Dedicated R&D or information and communication technology (ICT) surveys may show that substantial parts of the labour input is actually involved in IPP development and related to IPP investment on own account. Substantive shares of high educated labour will usually indicate that employees are engaged in managing production chains rather than in trading.

5.88 Further, manufacturers' associations may be consulted to list known FGPs, particularly when these companies are known to operate in specific industry branches, the most obvious being consumer electronics and semi-conductor industries.

5.89 Additional detection methods include data comparisons and analysis involving various data sources,

preferably on the basis of a single company identification number, such as:

- a) Detailed banking data on transactions in foreign currency classified as exports of goods could be compared with customs data on exports for individual enterprises. Whenever banking data on exports of goods for an enterprise are significantly higher than customs data, it may be suspected that there is a case of factoryless production of goods (or merchanting), and the financial reports have to be further examined. However, banking data may be subject to classification problems. Time lags in recording may play a disturbing role as well.
- b) Yet another detection method is the comparison of VAT data on exports with customs data on exports for individual enterprises. Whenever for a particular enterprise VAT data on exports are significantly higher than customs data, it may be suspected that there is a case of global manufacturing (or merchanting) and further research is probably required.

5.90 A more structural solution is to capture FGPs in the framework of enterprise surveys, preferably based on their explicit identification in the business register. The proposed review of the ISIC, related to the industrial classification of FGPs, supports this approach.

5.91 Recent country experience shows that questions in business surveys on offshoring the production of goods lead to satisfying results. However, the surveys require additional specific guidance and follow-up with the respondents compared to other surveys, since the observed arrangements may even be more complicated than foreseen at the stage of survey preparation, particularly because enterprises may be engaged in several forms of global production. Enterprises may report payments to sub-contractors; however, without the corresponding sales of products abroad being observed. This may indicate the building up of inventories abroad. Preliminary country results also indicate that the difference between merchanting and factoryless production cannot always be clearly made. This issue is further discussed below.

Delineating FGPs from traders

5.92 Under the current international accounting standards, it is probably sufficient to separately classify all distributors that are engaged in factoryless goods production, the main purpose of this exercise being supporting further analysis of these enterprises. Delineating FGPs from traders has stronger repercussions once FGPs are classified as manufacturers. Particularly for those companies which combine factoryless goods production with distribution related activities, the output of activities must be split in (a) the manufacturing related output (the output of goods at basic prices) and (b) trade related output (the trade

margin). This is not an easy task as it requires splitting the value added of these companies in manufacturing distribution related components.

5.93 The most important step in this decomposition is approximating the capital service of the relevant IPPs on the balance sheet of the company under examination. Expectedly these IPP related capital costs are manufacturing and not trade related. The size of these capital services may give a reasonable indication of whether or not the company is indeed to be classified as an FGP. The residual income element may be allocated as trade margin.

5.94 The concept of capital services is introduced in Chapter 20 of the 2008 SNA. The capital service represents the service flow of an asset to production. Conceptually a capital service should correspond to a capital rental value. For a deeper understanding of the subject, reference is made to the Organisation for Economic Co-operation and Development (OECD) manual on Measuring Capital (2009)¹⁹.

5.95 It is possible that an FGP obtains the R&D services of a dedicated R&D service provider. These services could be in the form of a purchase of an R&D asset or the purchase of R&D related capital services. This does not change the nature of the FGP. One advantage of such a situation is that IPP related asset values or capital service values can be directly observed from market transactions.

5.96 For "true" borderline cases a final judgement may be complicated by variability in the outcomes of the analysis over time. This may reflect reality as the relative size of trading and factoryless goods production in total output may vary over the course of several reference periods.

5.97 In conclusion, there are borderline cases for which the required small and detailed differences between trading/merchanting and factoryless goods production (and goods sent abroad for processing) are difficult to make on the basis of evidence obtained from surveys. Sometimes these nuances are not easily detected there. Particularly for the larger companies a custom-made evaluation may be the only way forward, benefiting from the supplementary evidence directly obtained from representatives of the enterprise in question.

¹⁹ Measuring Capital - OECD Manual 2009, Second edition: <http://www.oecd.org/publications/measuring-capital-oecd-manual-2009-9789264068476-en.htm>

Country case study 5.10

Identifying manufacturing services and factoryless goods production in the United States

The U.S. Census Bureau and BEA have been studying how to classify and collect data from entities that are part of Global Value Chains (GVC). A key element is identifying the relationship between firms that outsource the fabrication of products, while still controlling the production process, and firms that perform the processing as contract manufacturing services. Through preliminary outreach conducted by the Census Bureau, respondents appear to understand the concept of contract manufacturing services and the need for U.S. statistical agencies to collect the data. Collecting data, however, could be challenging. Some respondents indicated that they were generally unable to provide data because either accounting or production management systems did not include a searchable characteristic that would distinguish these services. To determine whether data collection can be robust, the U.S. Census Bureau and BEA have added questions to their respective surveys to determine whether U.S. businesses can accurately report purchases and sales of contract manufacturing services.

Direct Investment Abroad Survey

Every five years, BEA conducts the mandatory Benchmark Survey of U.S. Direct Investment Abroad (BE-10) to track the economic activity of U.S. multinational companies and their foreign affiliates. The BE-10 benchmark survey covers the entire universe of U.S. direct investment abroad in terms of value, and is BEA's most comprehensive survey of such investment in terms of subject matter. The survey collects detailed information on the financial structure and operations of U.S. parent companies and their foreign affiliates and on the transactions and positions between the parents and their affiliates. Any U.S. person (which includes companies) that had a foreign affiliate is required to report. If the respondent is a U.S. corporation, the respondent reports transactions for the fully consolidated U.S. domestic enterprise, which excludes foreign branches and other foreign affiliates.

To understand the activity of U.S. multinationals with respect to manufacturing services, BEA added questions on purchases and performance of contract manufacturing on the 2009 Benchmark Survey of U.S. Direct Investment Abroad for U.S. parents that are not banks (BE-10A). The questions were added to identify a group of firms engaged in manufacturing services that could be used either as a sample frame for a special survey on that topic or as a way to identify firms engaged in contract manufacturing that may be linked to data collected by the Census Bureau. A data link is performed when company identification codes from BEA files are matched to the corresponding companies in the Census Bureau files. The BE-10 survey defined contract manufacturing as "Contracting with a firm to process materials and components, including payments for fabricating, assembling, labelling and packaging materials and components." Because BEA was trying to identify a group of firms that engaged in contract manufacturing only yes/no questions were added to the survey. The BE-10 definition was broader than the international guidelines definition of manufacturing services as processing of materials and components owned by others. However, BEA requested respondents to answer if they owned some or all of the materials used by the contract manufacturers or if they did not own the materials.

BEA is in the process of collecting data from the Benchmark Survey of Transactions in Selected Services and Intellectual Property Products with Foreign Persons (BE-120) on manufacturing services on materials and components owned by others covering processing, assembly, labelling, packing and so forth undertaken by businesses that do not own the goods concerned. Reporting by companies on the contract manufacturing questions is voluntary and initial review of these questions indicates a low response rate.

Company Organization Survey

The Company Organization Survey (COS) covers all multi-unit companies with 250 or more employees and a selection of smaller companies to support other Census surveys. Companies with less than 250 employees are only selected for the COS when administrative records indicate that the company may be undergoing organizational change and is adding or dropping establishments. The Census Bureau focuses its efforts on collecting establishment information for large companies because of their importance to the economy. The COS is conducted annually in the four years between economic censuses. The COS is designed primarily to maintain the Business Register.

Several inquiries were included in the 2011 COS to enhance the Census Bureau's understanding of the relationship between the enterprise and its establishments, business models and global economic activity. In particular, the purchase and sale of manufacturing services and the impact of domestic FGPs, firms that are integrated manufacturers in their global reach but offshore manufacturing activities and would be classified as domestic wholesale trade under current U.S. industry classification guidance, has been problematic for capturing and interpreting national economic statistics in a global economy.

In 2010, an initial test by the Census Bureau to collect more detailed information on contract manufacturing services from several large firms found that the terminology was well understood. However, most of the characteristics of the

data sought, such as the value of the materials and components provided to overseas contract manufacturers, would have to be collected below the enterprise level. Based on this pretesting, the level of detail sought was reduced. A pilot test of 180 reporting units was conducted in the 2010 COS. Results from the pilot test indicate that reporters largely understood contract manufacturing as “outsourced transformation of own product” and were able to distinguish it from simple purchases of goods for resale.

The 2011 COS included contract manufacturing inquiries on approximately 40,000 surveys. Respondents to the 2011 COS survey were asked a series of questions as to whether they operate manufacturing facilities, provide contract manufacturing services incorporating patents, trade secrets, or proprietary technology owned by the principal, or purchase contract manufacturing services incorporating patents, trade secrets, or proprietary technology owned by the respondent’s company. Questions on R&D performance and revenues from royalties and license fees for the rights to use intellectual property were also included.

Responses were analyzed by the Census Bureau to determine if respondents purchased or sold manufacturing service and are engaged in factoryless production. For example, if a company has R&D conducted in the U.S., does not have foreign ownership, does not operate manufacturing facilities, but does purchase contract manufacturing services incorporating the company’s own patents, trade secrets, or proprietary technology; it is likely to be classified as a factoryless goods manufacturer. Initial analysis of the results of the survey showed that the potential “factoryless” producer population is likely to be small regardless of where a bright-line may be drawn for classification purposes. There is no “simple” set of criteria that is likely to identify the factoryless producer (as of yet). Ownership and large, complex, global enterprises may have business segments that would be factoryless producers even though they would not be at the enterprise level.

In addition to the contract manufacturing questions at the company level, special inquiries have been added to the 2012 Economic Census to collect information at the establishment level. The Economic Census is the Census Bureau’s most comprehensive measurement of the U.S. economy and is conducted in reference years ending in “2” or “7” and contains highly detailed industry, geographic and product statistics. The Census Bureau directly collects data from establishments of multi-establishment businesses and larger single-establishment businesses. For establishments currently classified in the manufacturing, wholesale trade, and management of companies sectors, questions on purchases of contract manufacturing services were added. In addition, for establishments currently classified in the manufacturing sector, questions on receipts from contract manufacturing services were added.

Next Steps

The results from the BEA BE-120 survey will be available soon. Once available, BEA can evaluate whether the value of receipts and payments for contract manufacturing services can be reported along with the destination of the goods after processing. The contract manufacturing services questions on the COS enterprise level survey discussed in this case study represent initial steps in determining if further data collection is likely to be robust and if the Census Bureau can identify factoryless producers in their surveys. As a next step, the Census Bureau will evaluate the special inquiries on the 2012 Economic Census to see if information at the establishment level can better identify factoryless manufacturers and to assess whether sufficient data can be collected on the value of the manufacturing service and the associated revenue on sales of products produced by contract manufacturers.

Country case study 5.11

Factoryless production of furniture

A few years ago a former manufacturer of furniture, company X, closed down its production in country A. Production was transferred to various contract manufacturers all over the world. Company X remained responsible for design (the blueprints), testing of products, marketing and sale. The goods designed by company X, many of which are patented, have developed over the years. Present output includes chairs for children, other equipment for the nursery and prams.

Currently parts of the furniture and equipment are produced by contract producers all over the world according to the blue prints (IPP) developed and owned by company X. Suppliers are chosen according to price, delivery reliability and quality. The different parts delivered by the suppliers are sent to logistics centres. From these logistic centres the completed product is subsequently sent to customers. Company X completely controls each of these deliveries. Almost all final output is shipped to customers outside of country A. Sales and related profits worldwide are reported in the business accounts of company X.

As recommended by ISIC Rev. 4 the NSI in country A classifies company X in its business register within retail and wholesale trade. However, determining the industry classification of a factoryless producer is not straightforward. A special feature in this case is that the raw materials as processed by the suppliers are not owned, while the produced parts as delivered to the logistics centres are under ownership of company X. The activities of the logistics centres

could be regarded as industrial processing, which would make company X a manufacturer. In any case, the intellectual property embedded in the products resembles a vital part of the production chain. As shown before, trading represents only a limited part of the economic activities carried out by the factoryless producer X.

A review of data sources

5.98 This section reverses the angle of the discussion on data requirements by reviewing the main characteristics of the most important data sources available to measure various aspects of global production. Rather than providing a sequence of methodological steps, as outlined in the former section, this section reviews particularly the potential of different data sources, providing the reader with some degree of flexibility in how these data sources are used in practice. This section also discusses some of the main conditions and requirements of these data sources in order to use them effectively in the context of global production measurement.

Business surveys, manufacturing

5.99 Manufacturing surveys are typically directed at establishments with annual and sub-annual cycles. Keeping in mind that not all firms are engaged in any particular form of global production, there should be an assurance that the survey frame is comprehensive and includes such firms. In addition the sample size should be sufficient and with an effective sampling strategy, also for the purpose of simply identifying those companies engaged in any form of global production. A priori information, for example obtained from company profiling can be of assistance in identifying large companies engaged in any form of global production. Such companies would ideally be in the take-all portion of the sample. At the very least, they should be in the take-all portion of the annual survey, if such a survey is used to supplement and benchmark the quarterly survey.

5.100 As FGPs should, according to international guidelines at present, be classified under trade, as a special case of merchanting, they may fall outside the frame of manufacturing statistics and are likely to be captured by trade statistics instead. It should nevertheless be emphasised that enterprises in the manufacturing industry may also be engaged in merchanting or factoryless goods production as part of their secondary output. Business surveys for the manufacturing industry are usually designed to collect information on trading activities (trade related turnover and trade related purchases of goods) in order to estimate trade margins. A split in domestic and foreign trade related sales and purchases may help observe merchanting as secondary output.

5.101 So, in manufacturing surveys, there needs to be a means to identify total revenues associated with main output, aside from revenues obtained from:

- a) Carrying out processing services (i.e. processing fees) on goods subject to foreign ownership;

- b) Factoryless goods production, where the physical transformation is carried out abroad;
- c) Merchanting (as a separate category of turnover from trade).

5.102 Similarly, purchases of goods should preferably be subdivided into:

- a) Intermediate goods used for main (manufacturing) output;
- b) Purchases from contract producers (under a factoryless goods production arrangement) abroad;
- c) Foreign purchases of goods subject to trade.

5.103 The terminology used in surveys may be a point of concern. As mentioned, processing or outsourcing more generally, is often referred to as *custom work* in surveys. As these kinds of activities have been around for some time, it is likely that most manufacturing-based surveys would already have such a split. It can be that the wording associated with various forms of global production is cumbersome and possibly not clear to respondents and might benefit from a review.

5.104 It is particularly helpful if manufacturing surveys cover all purchases and sales of goods subject to each of these three global production arrangements, including sufficient detail on the characteristics of these goods (in terms of CPC). This information may help make the required adjustments in merchandise trade statistics as discussed previously in this chapter.

5.105 Similarly it is recommended to add questions on (changes in) inventories of material inputs and (unfinished) goods held abroad, in relation to outward processing, factoryless goods production and merchanting. Business surveys are probably the only means to obtain information on inventories held abroad. The survey design should be such that the principle of economic ownership of inventories is leading, and not the physical appearance of inventories at a certain production location, particularly in cases where there is a difference between the two observation concepts. To be more specific:

- a) Inventories held abroad (due to e.g. processing abroad, goods sent abroad for repair, merchanting), but under ownership of a domestic principle, should be recorded in the balance sheet of this principal and, thus, in the balance sheet of the national accounts in which this principal is resident.
- b) Reversely, inventories held domestically, but owned by foreign principals for similar reasons, should not show up in the balance sheets of the national accounts.

Wholesale and retail trade surveys

5.106 As a first step it is advisable to profile distributors engaged in either merchanting or factoryless goods production and make sure these companies are sufficiently covered in the survey. The size of their representation may determine whether adjustments in survey designs are required to cover the specific features of these companies appropriately.

5.107 As a second step it is recommended to classify those companies that are predominantly engaged in factoryless goods production under a separate class of 'traders', particularly because the businesses of these companies are very different from distribution. A future step may be classifying these companies under (a special class of) manufacturers, pending on the adoption of such recommendations in the international standards.

5.108 The coverage of merchanting depends on the extent to which reporting addresses foreign (trade related) purchases and sales, and inventories held abroad. Otherwise, if merchanting (or factoryless production) is considered sufficiently important, trade surveys may need to be adjusted to specifically capture purchases and sales subject to merchanting. There is probably no other source available to obtain this information. Goods subject to merchanting may remain completely unobserved in merchandise trade statistics. Sufficient detail provided in the classification of foreign purchased and sold goods is another precondition for recording the net export from merchanting in the national accounts and balance and payments.

5.109 The survey may also need to be adapted to capture inventories of goods held abroad, as a consequence of carrying out merchanting activities.

International trade in services surveys

5.110 International trade in commercial services (SITCS) surveys are typically enterprise-based surveys with details on service categories and probably also on industries and geography (countries and regions). Maintaining good coverage can be challenging as firms engaged in international service transactions are not always that easy to identify. Often these surveys are smaller in terms of sample size compared to business surveys covering total domestic production activity. Links to a centralized business register with a flag for international activity, based on information obtained from other surveys, can help keep the SITCS survey frame and the applied sampling method up to date. More generally, such registers are equally important in bringing together and validating a wider range of survey results, including those of business surveys. A quarterly survey may be supplemented with a more detailed (in particular for geography) annual survey, which may be used to benchmark the sub-annual surveys.

5.111 The SITCS survey may not necessarily be geared to measure aspects of global production, such as processing fees, trade margins obtained from

merchanting or the IPP flows inside global production chains. Surveys may require improvement in terms of coverage and design. In doing so, it will be essential to ensure adequate coverage of both service and goods producing industries as both can be engaged in international processing and merchanting. Any profiling related to the cross-border dimension undertaken in the case of the manufacturing surveys and distributive trade's surveys as well as their survey frames would be useful in this regard.

Merchandise trade statistics

5.112 Merchandise trade statistics measure cross-border flows of goods. The adjustments needed in national accounts and balance of payments require recording of international trade on the basis of ownership transfer, discussed in detail in this chapter, including the use of "nature of transaction codes" derived from custom's records.

5.113 So-called importer-exporter registers may help combining the usually few sources available for making the adjustments in merchandise trade statistics. Such registers help establish the link between commodity trade data and business statistics. Various countries have developed importer-exporter registers which may also be linked to centralized business registers. Tying the aforementioned merchandise trade adjustments to firms in manufacturing via record linkages as well as linkages at commodity level can increase the accuracy and data confrontations and adjustments.

Foreign direct investment (FDI) surveys

5.114 FDI surveys are also briefly discussed in Chapter 3. These surveys on inward and outward FDI are enterprise-based, or legal entity-based. The purpose of FDI surveys is to collect information on FDI flows and stocks which may help explaining multinational enterprises' ownership structures. For both inward and outward FDI, it is typically possible to identify and isolate majority owned affiliates by industry. In fact, majority-owned foreign affiliates are the basis for foreign affiliate statistics.

5.115 Combining FDI statistics with other data sources may help obtain a better understanding of parent-affiliate relationships in terms of their roles in global production arrangements, particularly when information on the nature of economic relationships (and transactions) between these affiliated companies is incomplete. For example, a majority-owned foreign affiliate engaged in manufacturing, and a principal parent with no production plants in the domestic economy, may nevertheless report significant purchases (abroad) of raw materials and sales of final goods (abroad), which may then be assumed to be processed by the foreign affiliate.

5.116 Tying information from FDI statistics on ownership structures into manufacturing surveys and, or, merchandise trade data, will likely necessitate the use of

record linkages. To do this properly, the FDI frame is preferably connected to, or based on, the centralized business register.

Foreign Affiliate Statistics (FATS)

5.117 FATS contain two components: *inward* and *outward* FATS. Inward statistics on foreign affiliates represent those statistics describing the activity of foreign affiliates resident in the compiling economy. Outward statistics on foreign affiliates represent statistics describing the activity of foreign affiliates abroad controlled by the compiling economy. FATS cover both financial and non-financial industries. Variables collected within the FATS framework are e.g. turnover, value added, purchases of goods and services, R&D expenditure, personnel costs, number of employees, gross investment in tangible goods and international trade.

5.118 FATS requires that international trade data are somehow linked to the business or enterprise register. In this regard the FATS framework is already very valuable for improving the quality of data obtained from multinational enterprises (MNE). Perhaps more importantly, FATS may specifically focus on trade in goods and services between affiliated companies in different countries. This part of the FATS may only be obtained by carrying out supplementary surveys.

5.119 The Eurostat (2007) guidelines explain that intra-group trade transactions may be subject to transfer pricing, a fact that companies are unlikely to be transparent about. Nevertheless, FATS may help identify transfers of goods subject to processing, or IPP related intra-group transfers, particularly when dedicated supplementary surveying is done to obtain these pieces of information.

International data comparisons

5.120 For the largest and most complex enterprises the issue of data confrontations at national level are discussed in detailed in Chapter 6. Attuning survey designs and combining outcomes may be the obvious way to optimize coverage aspects of global producers in a concise way and at minimum cost and response burden.

5.121 The increasing complexity of global production chains and MNE structures underlines the importance of international data confrontations. Such forms of cooperation may entail:

a) *Alignment of business registers.* A clear initiative is the EU framework on Modernization of European Enterprise and Trade Statistics (MEETS), a cooperation project that started in 2008 to establish an inventory on the current implementation in the member states and to prepare guidelines for a more consistent data system. One of the key features is the development of a EuroGroups register. Another important objective is to develop a methodology for measuring global value chains and linking of

micro data on international trade and business statistics. This project may not only lead to further harmonization of register designs, units and survey designs but may be particularly helpful to address issues related to global production.

- b) *Alignment of approaches to measuring global production.* International organizations play an important role on this front, for example by providing a platform for regularly exchanging methods and identifying best practices, also based on the international comparisons of country results.
- c) *Alignment of international trade statistics.* Several so-called mirror exercises have been carried out at bilateral or multilateral level to adjust for asymmetries in international trade statistics. Globalization makes such analysis more relevant than ever and such exercises may particularly focus on intra-company flows of goods, services and IPPs in particular. One obstacle to such efforts is that legislation may exist in some jurisdictions that restrict the amount of information that can be exchanged with compilers in other countries. Another limitation may be that such an exercise is usually very resource demanding. Nevertheless, processes could be sought to facilitate this kind of work. A longer term objective would be developing an *international platform for micro data confrontations*, which will certainly help in reducing asymmetries in international trade statistics.

Conclusions and recommendations

5.122 This chapter discussed the measurement aspects of goods sent abroad for processing, merchanting and factoryless goods production by reviewing the required data items and associated adjustments in source statistics. Each of these global production arrangements require adjustments and additions in existing data collection systems and the need for the changes may be amplified by the on-going globalised dispersion of production chains. Yet these measurement challenges may not easily match the ongoing attempts of NSIs to reduce costs and response burden.

5.123 The recommendations of this chapter are summarized as follows:

- a) One of the biggest challenges is the required adjustments in merchandise trade statistics for their use in the national accounts and the balance of payments. Sufficient detail is often not available in the nature of transaction codes, nor sufficiently reliable, to make the required adjustments. In these cases it is recommended to add extra data items to business surveys, at least on an annual basis, to observe the international flows of goods related to processing (or merchanting), preferably in close correspondence to questions about processing fees paid to, or received from, foreign companies. A

particular concern is the estimation of exports of goods directly following processing. Without this information, corrections in merchandise trade statistics may be wrong and this will disturb the trade balance. Clearly this recommendation may contrast the obligation of statistical offices to minimize respondent burdens. However, it is unlikely that information on the above mentioned international trade flows can be obtained from any alternative source.

- b) It is possible that in some countries the available customs information is not fully utilized in the merchandise trade statistics. Some of this information may already exist in available customs data fields that are not fully captured or ignored for merchandise trade statistics purposes. In other words, existing but non-tabulated or non-analyzed fields might be able to provide important information for adjustment purposes. This might involve additional efforts by compilers as well as negotiations with customs agencies for access to additional records on customs documents. The ultimate goal is to have trade declaration documents that would allow the compilation of data both on shipment of goods and economic transactions.
- c) The transactions of goods under merchanting could either be observed by making corresponding adjustments in the business statistics of wholesale traders (asking for the purchases and sales of goods under merchanting), or in the international trade in services statistics. The minimum data requirement is to measure at least the trade in services connected to merchanting.
- d) When data sources are incomplete, or insufficiently reliable, data validation is recommended by bringing together, and reconciling, the results from business surveys, merchandise trade statistics and the international trade in services statistics, preferably on the basis of an integrated business register, and were needed at the individual enterprise level. This would be supplemented by the balancing of the supply-use tables.
- e) The value of processing fees, paid or received, should be observed from business surveys, or the international trade in services. The indirect calculation of these fees as the difference in the values of the goods before and after processing is not recommended as this is generally expected to give low quality results. It could be used, however, as a validation tool or to extend the result to full coverage of the activity.
- f) The design of business surveys should be such that inventories held abroad are explicitly captured. A split between domestic and foreign held inventories is quite helpful.
- g) The identification of actors engaged in merchanting or factoryless goods production may require special attention and methods to detect such cases are highlighted in this chapter. Further work with classification experts should lead to enhanced criteria for the separate identification and analysis of these two production arrangements.
- h) The activities of expected FGPs should be examined to decide whether these are genuinely manufacturing related (which means the observed company is indeed an FGP) or predominantly trade related (which means the company should be considered a trader). The required methods to make this distinction are discussed in this chapter.
- i) Data exchange between NSIs may help complete the picture of companies and industries engaged in each of the discussed forms of global production, and is, therefore, recommended. Such exchange may be facilitated by the establishment of common business registers, at least for multinational companies, such as the EuroGroups Register. It will also require the exchange of micro data, for example to eliminate asymmetries in international trade statistics or to complete the picture of global value chains and the operations of multinational enterprises. This may help determine a proper breakdown of these international production activities on a country-by-country basis. However, unfortunately at present many statistical offices face legal constraints when it comes to the exchange of micro data. NSIs are invited to look at ways to overcome these constraints for the sake of data validation and overcoming asymmetries in trade statistics.