



Measuring Global Production Arrangements in the Dutch National Accounts

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I. Introduction

1. Starting with the year 2010 the Dutch national accounts are compiled according to the SNA 2008 concepts. One of the most important changes in the SNA compared with the previous edition is that the principle of economic ownership as the basis for measuring economic transactions is applied universally and without exceptions. This change was implemented to improve the description in the national accounts of the growing globalisation of economic processes, in which production processes are more and more fragmented over different countries.

2. The Netherlands is a small country with an open international oriented economy. This means that the consequences for the Dutch national accounts of the new accounting rules of the SNA2008 are significant. Important globalisation arrangements of which the registration is influenced strongly by the introduction of the new concepts are:

- Goods sent abroad for processing
- Merchanting
- Other types of arrangements, for example factoryless goods producers (FGP's)

3. These global production arrangements will be reviewed in more detail in section 2.

4. Determining the right value of the transactions involved is one difficult task we face; detecting these arrangements when they appear is another one.

5. The available statistical sources are not always suited to meet the demands of the new SNA, but do nevertheless provide useful information as will be described in section 3.

II. Global production arrangements

A. Goods sent abroad for processing

6. Sending goods abroad for processing is one way of spreading production processes across countries in order to reduce costs (labour and capital), take advantage of investment incentives offered by host countries, and reduce companies' global tax burden.

7. According to SNA 1993 a change of ownership was imputed when goods were sent abroad for processing and a transaction was required for the value of the goods sent abroad, even when there was clearly no change of ownership and the only financial payment was for the cost of processing. Again, a change of ownership was imputed when the goods returned after processing and a transaction was recorded in the national accounts of the value of the returned goods.

8. The growth in cross-border processing led to concerns about the inflation of trade flows, the dependence on transfer pricing to determine values, and the inconsistency with the corresponding financial transactions. In other words, imputing a change of ownership for goods sent abroad for processing did not reflect the economic reality.

9. SNA 2008 does not allow any imputations for change of ownership. If there is no change in ownership of the goods sent abroad for processing, the only transaction that takes place is the payment for the processing service by the principal to the processor.

10. Even though the Dutch foreign trade statistics in goods (ITGS) does not make a proper distinction between regular trade in goods and goods sent abroad for processing, the measurement of the straightforward case where goods are sent abroad for processing and return afterwards should usually not be too complicated. However, in many cases the situation is less straightforward. For example, often the processed goods do not return to the country of the principal, but are distributed directly to the final users from the country of

the processor and do not return to the country of the principal first. Applying the standard processing adjustments to the ITGS-data may lead to serious imbalances in the national accounts. The same type of problems may occur when a company is not only a processor, but is also an own account producer.

B. Other global production arrangements

11. The previous section discussed global manufacturing arrangements in which goods are sent abroad for processing. The material inputs or semi-manufactured goods are thereby sent from the country of the principal to the country of the processor.

12. This section discusses some other global manufacturing arrangements. One of the other possible arrangements is one in which the material inputs are purchased by the principal from suppliers in the processing country or third countries and shipped directly to the processor. The goods do not cross the border of the country of the principal. After processing, the goods are sent directly to the customers who are usually located abroad.

13. According to SNA2008/BPM6, the purchase of material inputs by the principal has to be recorded as import of goods in the country where the principal resides, since the economic ownership of the goods changes from a non-resident to a resident. The sale of finished products by the principal has to be recorded as export of goods in the country where the principal resides, since a change of ownership occurs from a resident to a non-resident.

14. From the perspective of the country of the processor, this global manufacturing arrangement is treated the same way as the goods sent for processing discussed above. The inflow of the raw materials from abroad and the outflow of the finished products to other countries have to be removed from the foreign trade in the national accounts.

15. The material inputs and finished products, however, do not cross the border of the country of the principal and are therefore not included in the ITGS. The import and export of these goods have to be imputed in the country of the principal using other sources.

16. Another global production arrangement is an arrangement where the principal outsources the production process, but does not become the owner of the material inputs at all (a so-called factoryless goods producer). In this case the principal should be classified as a trader.

17. In section 4 we discuss the method used by Statistics Netherlands to identify enterprises that are engaged in this form of global production and the method used to impute related foreign trade flows in the national accounts.

18. Note that section 4 discusses ‘outward’ global production arrangements in which an enterprise that is resident in the Netherlands produces (part) of its production abroad and the goods (material inputs and finished goods) do not cross the Dutch border. There are also manufacturers that reside in the Netherlands that produce manufacturing services on goods owned by non-residents and the goods are not sent from or returned to the country of the owner. The statistical treatment of these cases of ‘inward’ global production arrangements are no different from inward processing (as discussed in section 2.1) from the perspective of the Dutch economy. These cases are therefore not discussed in this paper.

C. Merchanting

19. Merchanting can be defined as the purchase of goods by a resident of the compiling economy from a non-resident, with the subsequent resale of the same goods to another non-resident, without the goods entering the compiling economy. It is recorded first as a

negative export of goods and then as a positive export of goods, with any timing differences between the purchase and sale being recorded as changes in inventories.

20. Merchanting is in some way the opposite of goods sent abroad for processing. Goods that are sent abroad for processing do cross the border but are not considered as international trade in goods, whereas in the case of merchanting goods do not cross the border, but are considered as international trade in goods.

III. Available source statistics

21. In the supply and use tables of the national accounts the transactions that are influenced most by the new accounting rules of SNA 2008 are production, intermediate consumption and the imports and exports of goods and services. The most important statistical sources for the measurement of these transactions are:

- Structural Business Statistics (SBS)
- Finance of enterprises (SFO)
- Short Term Business Statistics (STS)
- Prodcom
- Foreign trade in goods (ITGS)
- Foreign trade in services (ITSS)

22. The description of these source statistics below will show that some, but not all of these sources are fully compatible with the SNA 2008 concepts. This means that the results of these sources cannot be used in the national accounts without adaptations. On the other hand, as will be shown in section 4, this conceptual inconsistency between sources can help us to detect global production arrangements.

1. Structural Business Statistics

23. SBS is a yearly survey measuring turnover and costs of enterprises according to the SNA 2008 ownership principle. In SBS for the manufacturing industry the distinction is made between turnover of goods produced within the Netherlands and of goods produced abroad. Manufacturing services produced by the enterprise are also recorded, split into manufacturing services invoiced to domestic and to foreign customers. In SBS for wholesale trade a breakdown is made of wholesale trade turnover by cross-border distributive trade and merchanting.

2. Short Term Business Statistics

24. STS is a monthly or quarterly survey measuring turnover of goods and manufacturing services. Like SBS it is based on the ownership principle. However, there are also differences. The questions asked are more limited: there is no split between turnover of goods and services and there is no question concerning the costs for the enterprise. Also, the distinction between goods produced in the Netherlands and goods produced abroad is not available. On the other hand, in STS the distinction between sales to domestic customers and foreign customers is made. In SBS this distinction is not available.

3. Finance of enterprises

25. SFO is an annual survey. It contains questions on turnover and costs consistent with SBS (i.e. according to the ownership principle) for the enterprise group. A full balance sheet for the enterprise group is a part of the survey.

4. Prodcom

26. Prodcom provides statistics on the production by enterprises of manufactured goods within the Netherlands. The term comes from the French “PRODUCTION COMMunitaire” (Community Production) for mining, quarrying and manufacturing; sections B and C of the Statistical Classification of Economic Activity in the European Union (NACE2).

27. Beside the production of goods, the value of produced manufacturing services in the Netherlands are also asked. The difference between Prodcom and the sources described above is that Prodcom is limited to goods produced within the Netherlands, whereas in STS, SBS and SFO ownership of goods is the deciding criterion.

5. Foreign trade in goods

28. ITGS is a monthly statistic providing data on the value of imports and exports of goods, specified by type of good and country of origin/destination. ITGS has its own separate European guideline, which has not adapted to the new SNA 2008 rules. This means that ITGS still records imports or exports of goods when goods cross the international border regardless, whether or not a change of ownership takes place.

6. Foreign trade in services

29. ITSS is a quarterly survey. It provides information on imports and exports (i.e. a service transactions between a resident and a non-resident) of services broken down by service types and countries. ITSS is fully compatible with SNA 2008.

30. From this short description it can be concluded that inconsistencies between the numbers reported by these source statistics appear as soon as the “territorial principle” does no longer coincide with the “ownership principle”. The next section will describe these inconsistencies in more detail and also the way in which these inconsistencies can help us to detect global production arrangements and find the transaction values needed.

IV. Implementing the SNA2008 concepts

31. As argued in the previous section, due to the different nature of the various source statistics, inconsistent results may show up. Table 1 shows the different production arrangements discussed before and the results for production, imports and exports shown by the different statistical sources. It needs to be mentioned that the cases presented in table 1 are ideal and simplified cases. For instance, in the case of outward processing it is assumed that all (semi-manufactured) goods are sent abroad to be processed and all finished goods return to the country of the principal after processing. In reality this is of course often not the case. For instance, often goods do not return after processing, but are directly sold from the country of the processor. Introducing more realistic cases will make the table very large and hard to understand. The case studies of section 5 are real cases, so all kinds of complications will show up there.

Table 1: Transactions recorded in the available sources in different production arrangements

	Production of good in the Netherlands I	Inward processing II	Outward processing III	Factoryless Goods Production IV	Merchanting V
Transaction/ Source					
Turnover					
Prodcom	Goods (finished products)	Goods/Manufacturing services (*)	Goods (semi-manufactured products)	n.a.	n.a.
STS	Goods (finished products)	Manufacturing services	Goods (finished products)	Goods (for resale)	Goods (for resale)
SBS	Goods (finished products)	Manufacturing services	Goods (finished products)	Goods (for resale)	Goods (for resale)
SFO	Goods (finished products)	Manufacturing services	Goods (finished products)	Goods (for resale)	Goods (for resale)
Imports					
ITGS	Raw materials/semi-manufactured goods	Raw materials/semi-manufactured goods	Finished products	---	---
ITSS	---	---	Manufacturing services	Goods under merchanting	Goods under merchanting
SBS	---	---	Manufacturing services	Goods (for resale)	Goods (for resale)
SFO	Raw materials/semi-manufactured goods	---	Manufacturing services	Goods (for resale)	Goods (for resale)
Exports					
ITGS	Finished products	Finished products	Raw materials/semi-manufactured goods	---	---
ITSS	---	Manufacturing services	---	Goods under merchanting	Goods under merchanting
SBS	---	Manufacturing services	---	Goods (for resale)	Goods (for resale)
STS	Finished products	Manufacturing services	---	Goods (for resale)	Goods (for resale)
SFO	Finished products	Manufacturing services	---	Goods (for resale)	Goods (for resale)

(*) - Manufacturing services should be reported as such in Prodcom, but in practice enterprises often report the value of the processed goods, if they still have access to the necessary financial information.

32. The first column shows the case were the Dutch resident enterprise produces goods in the Netherlands on its own account. In this case the territorial principle and the ownership principle are not conflicting, resulting in consistent figures for all statistical sources under review here. To avoid misunderstandings: The symbol ‘---’ in the table for ITSS does not mean that no services are imported or exported at all; it simply means that no manufacturing services are imported since the physical production process takes place within the Netherlands. In SBS no import or export of goods are measured, only imports and exports of manufacturing services.

33. In case of *inward processing* (column II) inconsistencies appear. The enterprise will report the production of manufacturing services, but ITGS shows exports of finished goods and imports of raw materials.

34. In case of *outward processing* (column III) we find inconsistencies in the production reported in the different source statistics. Both STS en SBS report production of finished goods but the Prodcom does not. Also in the international trade figures inconsistencies will show up; ITGS reports values for imports and exports of goods, while ITSS/SBS and SFO will only report a (much) lower value for import of services and no export value.

35. Also the case of *Factoryless goods production* (column IV) shows inconsistencies. It is assumed here that factoryless goods producers (FGP's) are categorised as a wholesale traders and are asked to fill in the SBS wholesale questionnaire (which differs from the questionnaire for the manufacturing industry). For the same reason it is assumed that Prodcom information is not available for FGP's. In ITGS no imports or exports will be reported; all other available sources will report trade in goods. Also, operating surplus of a FGP's may be high compared with other wholesale traders. The trade margin of FGP's includes, next to the conventional trade margin often also a remuneration for their intellectual property products (IPP) input.

36. In case of *merchandising*, (column V) according to STS and SBS goods are traded, but ITGS does not report imports or exports of goods. The quality of merchandising data is often low. Partly this is caused by the fact that imports and exports of goods under merchandising can by necessity only be surveyed in ITSS and SBS, since ITGS only detects cross-border flows of goods. This may lead to misunderstandings amongst the enterprises surveyed, because merchandising is often regarded as a goods transactions by companies and not as a services transaction. Also, the survey sample of ITSS may not be the best suited for measuring merchandising transactions.

37. Table 1 shows how inconsistencies show up in the available source statistics, enabling us to identify the different global production arrangements. The next step is estimating the correct values of the transactions involved, according to the SNA 2008 concepts. Of course, the best way to get the information needed is to contact the enterprises involved directly and solve the inconsistencies. In the Netherlands this procedure is followed by a special department, the Large and Complex Cases Unit, for the 300 largest and most complex enterprises.

38. Due to capacity problems at the statistical office and also to keep the burden to respondents within acceptable limits, this procedure is not always possible and certainly not for all enterprises that may be involved in global production arrangements. Besides that, inconsistencies may only become apparent during the integration of data in the national accounts and the available time to solve the problem is very limited.

39. An alternative approach is to use the (although inconsistent) information for the available sources to estimate the transaction values needed.

40. Table 2 shows how the information (and inconsistencies in that information) from the available statistical sources may help us to estimate the transaction values needed. The table shows inconsistencies and relations between variables from the different sources that you would expect to find, once you have decided the type of production arrangement. Again, this is a schematic representation of reality. Real world cases are often more complicated and straightforward as will be shown in the next section, were some actual cases will be presented.

Table 2: Inconsistencies/relations between variables in available source statistics under different global production arrangements

	Inward processing I	Outward processing II	Factoryless Goods Production III	Merchanting IV
a	Export ITGS should be > Export SBS / SFO	Turnover Prodcom should be < turnover STS / SBS / SFO	No imports and exports in ITGS reported	No imports and exports in ITGS reported
b	Import ITGS should be > import SBS / SFO	Export ITGS should be > Export STS / SBS / SFO	Goods under merchanting reported in ITSS and SBS	Goods under merchanting reported in ITSS and SBS
c	Export of manufac. services STS/SBS should = Turnover STS/SBS	Import ITGS should be > Import STS / SBS / SFO	High operating results compared with other wholesale traders	
d	Turnover Prodcom should be > Turnover SBS/SFO		Wages and salaries are often higher than usual in trading companies	
e	Prodcom turnover - Export ITGS should be \approx Domestic use (*)			

(*) - Manufacturing services should be reported in Prodcom in case of inward processing, but in practice enterprises often report the value of the processed goods, if they still have access to the necessary financial information.

V. Case studies

41. In this section six cases are presented that give an impression of the type and mixture of global production arrangements used by multinationals operating in the Netherlands. The cases demonstrate the difficulty in identifying global production arrangements using available statistical sources. Using the inconsistencies and relations between variables in available source statistics presented in table 2 is usually not enough. Often Statistic Netherlands needs to contact the companies to receive the necessary data to comply to the national accounts principles.

A. Case study 1: Inward processing

42. Company A is a subsidiary of a multinational chemical corporation that provides chemical, plastic, and agricultural products and services to consumer markets that include food, transportation, health and medicine, personal care and construction, and operates in approximately more than 100 countries.

43. The corporation has a production facility and an administrative service company in the Netherlands. The latter is responsible for finance and bookkeeping services for group companies in several countries.

44. The production facility in the Netherlands (company A) produces chemical products. The economic ownership of the raw materials and finished products lies with the parent company in Switzerland. So company A delivers an industrial service to Switzerland for which it receives a fee.

45. One of the sources revealing the existence of a processing agreement is the annual report. In the annual report the following is written: “the objectives of the Company are the manufacture, trade and storage of chemical and related products. Effective July 1, 2002, the manufacturing activities take place on the basis of a consignment manufacturing agreement with the parent company in Switzerland (entrepreneur).”

46. For fiscal reasons, some customers want to be invoiced by a Dutch company. Therefore, part of the processed goods are purchased by company A and sold to customers worldwide.

47. In 2014 the following was filled-in by the respondent in the different source statistics:

Table 3: Figures of company A in the available statistical sources

Statistics		Revenue	Costs of goods sold	Export	Import
SBS	Total	1815	814	986	0
	Processing fee	986		986	
	Sales of wholesale trade goods	829	814		
STS		1881		1521	
SFO		1860		1474	1245
Prodcom		5395			
ITSS				987	61
ITGS				5361	4219

48. The table contains a number of inconsistencies and relations between variables in the source statistics that were provided in table 2 of the previous section relating to inward processing, such as:

- Ia. Export in ITGS is higher than export in STS and SFO
- Ib. Import in ITGS is higher than import in SFO
- Id. Turnover Prodcom is higher than turnover from SBS, STS and SFO

49. The following two relations between source statistics do not hold in this particular case:

- Ic. Export of manufacturing services in SBS = turnover SBS
- Ie. Prodcom turnover – export ITGS \approx domestic use

50. These two relations do not hold, because company A (processor) purchases a share of the processed goods from the mother company in Switzerland (principal) and sells the goods on own account to customer in the Netherlands and abroad. Therefore, the turnover in SBS is higher than the revenue from manufacturing services provided and the export in ITGS includes not only the goods returned to the principal after processing, but also the export of the wholesale trade goods by company A.

Problems with Prodcom

51. For company A it is not possible to deliver the Prodcom data on production in the Netherlands. Quantities are available, but sales values are only available at the parent company in Switzerland.

52. Statistics Netherland is only allowed to survey Dutch companies. This means that the Prodcom values had to be estimated. This was done using the ITGS value supplemented with the revenue with Dutch destination that was mentioned in the annual report. This production is not measured in the international trade statistics as it doesn't pass the Dutch border.

B. Case study 2: Inward processing

53. This second case study is included to show how an inward processing agreement is detected when it becomes effective. Usually the change is first visible in the quarterly statistics.

54. Company B is an American-English owned tobacco manufacturer. The company has its presence in the Netherlands through a production facility and a trade organisation.

55. The production facility in the Netherlands is a manufacturer of cigars. Until 2012 the company was the economic owner of the cigars produced in the Netherlands.

56. In the first quarter of 2012 a foreign subsidiary of the parent company and Company B entered into an inward processing arrangement. At the end of Q1-2012 company B provided industrial services for the foreign subsidiary. The complete ownership of the raw materials and finished products was transferred abroad. This transfer of ownership was first noticed in the Short term statistics (STS). In 2011 the company showed a steady revenue pattern and stable inventory (table 4):

Table 4: STS results of company B, 2011

Quarter	Total Revenue (€x1000)	Export (€x1000)	Inventory (€x1000)
Q1-11	38.508	26.188	5.569
Q2-11	43.904	33.073	4.627
Q3-11	40.720	30.355	5.567
Q4-11	44.227	32.563	4.903

57. The change in ownership took place in the first quarter of 2012 and was instantly visible in the STS figures (table 5).

58. When an entity enters into a processing arrangement as a processor, all existing inventory needs to be transferred to the new owner at market value. This change in ownership will lead to a sharp rise in revenue as well as a sharp decrease in inventory. In table 5 this process is visible in Q1-12, when revenue suddenly more than doubled compared to previous periods and inventory got cut into half. The revenue recognised here is not yet part of the tolling agreement.

59. In the second quarter of 2012 the inward processing arrangement became effective. The execution phase of the arrangement can be identified from a sharp decline in revenue and (almost) complete reduction of inventory compared to t-1. A further indication that the processing arrangement is in place, is that export equals total revenue, since total revenue is provided by the foreign company under the arrangement (see table 2, 1.c). There are no domestic sales left. As can be concluded from table 5, revenue fell by 75%. and inventory was practically non-existent.

Table 5: STS results of company B, 2012

Quarter	Total Revenue (€x1000)	Export (€x1000)	Inventory (€x1000)
Q1-12	86.427	75.746	2.390
Q2-12	11.232	11.232	59
Q3-12	10.766	10.766	0
Q4-12	9.427	9.427	0

60. If inward processing is detected at an early stage using STS data, it is common practice at Statistics Netherlands to instruct the contact person of the company what changes in other sources we expect to see. In this specific case, the contact person was instructed to report the fee the company receives for the manufacturing services in ITSS. Second, the contact person was instructed how to fill out the SBS questionnaire. Finally, statistics Netherlands checked if Company B was still able to fill out the Prodcum, because in some inward processing agreements, the information necessary to fill out this survey is also transferred to the foreign company for which the industrial services are provided.

C. Case study 3: Outward processing

61. Company C is a Canadian owned manufacturer of agricultural products. In the Netherlands company C has its presence through several production facilities. This case describes how outward processing at company C was detected, and which sources were used to do so.

62. When Company C was first picked up by the Large and Complex Cases Unit, the information as presented in table 6 was received.

Table 6: Figures of company C in the available statistical sources

Source (x1000 €)	Export	Import	Revenue from own production			Trade revenue	Total revenue
			Total	Production in NL	Production abroad		
ITSS	25.500	215.500	n/a	n/a	n/a	n/a	n/a
ITGS	299.500	91000	n/a	n/a	n/a	n/a	n/a
STS	260.000	n/a	280.000	n/a	n/a	n/a	280000
SBS	0	0	350.000	350.000	0	740.000	1.090.000
Prodcom	n/a	n/a	300.000	300.000	n/a	0	300.000

63. Of the inconsistencies given in table 2 for outward processing, only I Ib and I Ic hold:

- I Ib: Export ITGS > Export STS/SBS
- I Ic: Import ITGS > Import SBS/STS

64. The data raises several red flags. First, the export value of goods according to ITGS is higher than the production value according to STS. Second, when the Prodcom is compared to ITGS, it appears the consumption in the Netherlands is nil (300.000 – 299.500). This seems highly unlikely. Finally, SBS indicates there are considerable distributive trade activities. If the data is consistent, these activities should also appear in the STS, ITGS and/or ITSS. The latter contains the goods acquired and sold under merchandising.

65. Based on this information it is unclear what is going on at company C. What is clear however, is that the data is inconsistent and clarification is necessary before the information can be used without intervention by statistics Netherlands.

66. Since no external sources were available, the company was contacted to provide explanations for the inconsistencies perceived.

67. It turned out Company C had several outward processing contracts in place whereby the company purchases material inputs which it sends to contract manufacturers who transform the material inputs into finished goods. The material inputs and the finished goods do not cross the Dutch border.

68. The company used different sources to fill out the questionnaires, which led to inconsistencies. The contact person who filled out the STS statistics, worked at the tax department of company C. The information he provided was related to the VAT and only contained the transactions which should be reported to the fiscal authorities, valued at the fiscal principles. The other contact person filled out the other statistics and he used the commercial (GAAP) accounting principles. As a consequence of the valuation principles used by the company to fill out the STS and SBS, the value of the finished goods that were produced by the processors abroad were reported in the turnover in SBS, but not in STS.

69. The company also had difficulties understanding the questionnaire for the SBS and as a result filled out the outward processing agreements under ‘trade revenue’.

70. After clarifying what should be reported, the information as presented in table 7 was received.

Table 7: Figures of company C in the available statistical sources, corrected.

Source (x1000 €)	Export	Import	Revenue from own production			Trade revenue	Total revenue
			Total	Production in NL	Production abroad		
ITSS	25.500	215.500	n/a	n/a	n/a	n/a	n/a
ITGS	299.500	91.000	n/a	n/a	n/a	n/a	n/a
STS	980.000	n/a	1.050.000	n/a	n/a	n/a	1050000
SBS	n/a	n/a	1.090.000	350.000	740.000	0	1.090.000
Prodcom	n/a	n/a	350.000	350.000	n/a	0	350.000

71. The fact that the revenue from production abroad in SBS is greater than zero indicates that the company is participating in some type of outward processing arrangement.

72. Of the inconsistencies and relations between source statistics given in table 2 in the previous section for outward processing, only IIa applies, i.e.

IIa. Turnover STS/SBS > turnover Prodcom

73. The other inconsistencies and relations only apply in case the material inputs are sent from the country of the principal to the country of the processor and the finished goods are all returned to the country of the principal.

74. Unfortunately, this particular company does not fill in the SFO survey. But in general, when SFO data is available, the following inconsistencies hold in case the material inputs and the processed goods are owned by the principal, but do not cross the border:

1. Export STS/SFO > export ITGS + ITSS
2. Import SFO > import ITGS + ITSS

D. Case study 4: Factoryless goods producer (registered as trader in NA)

75. Company D is an American liquor company. In the Netherlands the company has established a wholesale organisation, employing approximately 200 people. This case demonstrates that a company can undergo several global production arrangements simultaneously.

76. The following table shows inconsistencies between variables in the source statistics that lead to a closer investigation of this company.

Table 8: Figures of company D in the available statistical sources

Source	Export (€x1000)	Import (€x1000)
ITSS	0	0
ITGS	0	0
STS	2.800.000	n/a
SBS	2.800.000	1.180.000

77. As can be concluded from table 8, in STS and SBS the company reported exports (which equalled total revenue) of 2.800 million euro on a yearly basis. In the international trade in services and international trade in goods, nothing was reported to Statistics Netherlands.

78. If the data is consistent, the international trade should be equal to the STS and SBS for wholesale companies, as cross-border distributive trade is captured in ITGS and merchanting in ITSS. This is clearly not the case for this entity. Further investigation is necessary.

79. After digging deeper into the numbers, there are two strong indicators that this entity is not a normal trader.

- The wholesale trade margin of this entity exceeds the value of the purchased goods (2.800 euro sales and 1.180 million euro cost of goods sold.)
- In SBS, manufacturing service fees of 200 million euro were reported each year. This is not typical for a wholesaler.

80. When the contact person for this entity was confronted with the two observations above, he revealed two outward processing contracts.

81. The first contract covers brown spirits. The production facility abroad is the economic owner of every production step up until casks are selected for blending. The entity in the Netherlands is the economic owner of the last part of the production cycle: from the selection of the casks for blending to the finished, bottled products. All production steps are performed by the entity abroad and the Dutch entity pays a fee for the services performed.

82. The second contract covers white spirits. The essence of this contract is the same as the first, except there are brand specific ingredients used in the production process. These brand specific ingredients are purchased and owned by the Dutch entity. The nonspecific brand ingredients are owned by the production facility abroad. The production facility abroad consumes the raw materials owned by the Dutch entity to produce the finished products and then invoices the brand owner for the work performed. This can either be a blending fee, or a conversion charge.

83. NACE classification of this entity is difficult, because the two processing contracts differ in nature. Under a usual processing contract, the processor does not own the majority of the raw materials. In this case, however, the production facility abroad does obtain economic ownership of a majority of the raw materials in parts of the production process.

84. To determine the NACE classification, the point where economic ownership was transferred was looked at. More specific, the product before transfer of ownership and the finished product after transfer of ownership were benchmarked against the international trade in goods product classification, to see if a transformation had indeed taken place.

85. In the first processing arrangement, ownership of the goods changed right before the blending process. From that moment up to the sale of the finished goods to customers, no transformation of goods occurs according to the international trade in goods product classification. In this arrangement company D does not own any of the raw materials used in the production process. The company does, however, own all the trademarks and controls the production process as it determines prices, volumes and the quality requirements of the finished goods. Therefore, company D is classified as a factoryless goods producer in this arrangement.

86. Under the second processing arrangement company D supplies brand specific ingredients to the processor. Therefore, company D is classified as a producer and the arrangement is classified as outward processing.

87. In an ideal world, the first arrangement should be accounted for as factoryless and the second should be accounted for as outward processing. This, however, would involve a custom approach in data collection and the company would be required to split the revenue

and costs by brand which would be a lot of work and prone to errors and subjective decisions by the company. Since the first arrangement is the largest and there was a risk of receiving faulty data, the pragmatic choice was made to classify the whole entity as a factoryless producer.

88. Comparing the data in table 8 with the inconsistencies you would expect given a FGP-arrangement (as indicated in table 2), we can conclude that IIIa and b hold:

- IIIa: No imports and exports reported in ITGS
- IIIb: Goods under merchanting reported in SBS

89. Notice that goods acquired and sold under merchanting were not reported in ITSS by company D in the past. Only recently the company has been requested to fill in ITSS.

90. This case is an illustration that the clear cut examples found in the manuals are seldom found out in the field and pragmatic choices regarding data collection and classification of entities have to be made for nearly all companies.

E. Case study 5: Factoryless goods producer (registered as producer in NA)

91. Company E is a multinational company that develops, manufactures and sells electronic products around the world. The European headquarters are located in the Netherlands.

92. Company E reported the following international transactions in goods and services to Statistics Netherlands.

Table 9: International trade figures of company E

Source	Export (mln euro)	Import (mln euro)
SFO	8.770	8.584
ITGS	570	650
ITSS	1.254	3.831
STS	9.190	n/a

93. There is a big discrepancy between the value of exports and imports reported in SFO and STS as compared to the sum of the values reported in ITGS and ITSS. This is an indication that this company could be participating in a global manufacturing arrangement.

94. To find out the reason(s) for these inconsistencies, Statistic Netherlands looked at the activities of the company in the annual report of the Chamber of Commerce and also contacted the company. This resulted in the following profile:

95. Company E manufactures electronic products for all clients located in Europe. However, the company does not own any manufacturing facilities. It has contracts with independent manufacturers in several countries.

96. When a client purchases a product through one of the group companies in Europe, company E places an order with a contract manufacturer. The contract manufacturers purchase the material inputs from third parties and use the blueprints supplied by company E to make the finished products. Company E does not own most of the material inputs. The company only keeps a small inventory of material inputs for emergency situations.

97. The contract manufacturers sells the finished products to Company E at cost price plus a mark-up for the provision of manufacturing services. The contract manufacturers do not hold any inventories of finished products. Company E distributes the product to end-customers. Only the finished goods that are sold to customers in the Netherlands and a few

European countries cross the Dutch border. Therefore, the value of import and export in ITGS is much lower than in SFO and STS.

98. Given these facts we concluded that Company E has to be classified as a factoryless goods producer. Unlike the examples of factoryless goods producers given in the Guide to Measuring Global Production, Company E does not own the intellectual property products that are included in the finished products. The company purchases the IPP's from a non-resident group company.

99. Company E is registered as a manufacturer in the Dutch national accounts, because at the time of the last revision (revision of statistical year 2010) it was unclear whether the company was the owner of the material inputs used by the contract manufacturers. Recent company visits have revealed that this is not the case.

100. The discussion of whether to record factoryless goods producers as manufacturer or trader is still on-going. Statistics Netherlands has decided to maintain the classification of Company E as a manufacturer, until those discussions are completed.

101. Company E reports the following for revenues and costs in the surveys:

Table 10: Production value reported by company E in the sources available

Source	Turnover (mln euro)	Costs (mln euro)
SFO	9.046	8.851
SBS	9.150	8.995
STS	9.280	n/a

102. The values for production and intermediate consumption reported in the surveys are consistent with each other. The company reports all sales of final products produced by the non-resident contract manufacturers as production in its accounts. The company also sells after-sale supporting services for its products to customers in the Netherlands and abroad. The breakdown between goods and services is not given in the surveys. From the annual report we derive that about 14% of the revenue is derived from services.

103. The SBS gives a breakdown of intermediate consumption between goods and services and also gives a specification to certain service categories. The value of intermediate consumption includes the value of goods purchased from contract manufacturers (5 billion euro). The purchase price of the goods includes the fee paid to contract manufacturers for the industrial services. The value of intermediate consumption also includes the value of royalty and licenses (3 billion euro) purchased from an affiliated company in Europe.

104. The ITGS figures in table 9 are much lower than the SFO and STS figures, since ITGS only registers the goods that cross the Dutch border. Only the goods that are destined for final use in the Netherlands and in neighbouring countries, are recorded in ITGS. Since no change of ownership of the goods takes place when the goods cross the border, the ITGS values are not recorded as international transactions in the national accounts. In the next section the measurement of the import and export of goods is discussed.

F. Case study 6: Economic versus legal ownership

105. This case¹ study shows a company that obtains legal ownership of goods without becoming the economic owner. The latter remains with non-resident affiliated companies that own the intellectual property rights of the goods.

106. A Dutch company F is a wholesaler in pharmaceutical products. The ultimate controlling institutional unit is resident in the United States (U.S.). The Dutch enterprise is the legal and not the economic owner of the goods it obtains. This reality is underlined by the company itself. Annual company reports of company F explain that “Most inventories held in the Netherlands are for risk and account of those parties holding the intellectual rights of the products”. In case of damage of the products or unpaid receivables, the intellectual property (IP) holders in either the United States or United Kingdom (UK) compensate Company F for these losses. This implies economic ownership of these inventories is situated with the IP holders in either the United States or the UK but not with Company F.

107. The goods are shipped to company F from either Puerto Rico or Spain. In Spain raw materials are converted to intermediate products. The company in Spain obtains a processing fee from the economic owners in the UK or the U.S. Shipment of these goods to company F in the Netherlands coincides with a transfer of legal ownership from the IP holders to company F.

108. From Puerto Rico raw materials are shipped via the Dutch airport Schiphol to Germany at which stage legal ownership of these shipped goods is transferred by the IP holders to company F the Netherlands. Company F receives an invoice from the IP holders for the transferred goods. The raw materials are transformed to intermediate products by a German manufacturer (legal ownership remains in the Netherlands) who obtains a processing fee from company F for the industrial services provided.

109. The final goods are sold to either the economic owner in the United States or to yet another affiliated company in the Netherlands. In both cases company F transfers legal ownership and the turnover obtained from the sales of the final goods.

110. Company F has an “Advanced Pricing Arrangement” with the Dutch tax authorities. According to this agreement the company is required to pay income taxes, at the legal rate, based on a percentage of its operational costs. The company is not responsible for setting intercompany prices nor for serving third-party customers. Such arrangements are carried out by the economic owner in the United States and UK. The purchase prices vary substantially over the years.

111. It is concluded that goods handled by company F in the Netherlands are not economically owned by this company. As a result these flows of goods should not show up in SBS, STS and SFO. An agreement with company F was made to report on the gross margin as a proxy of net revenue. No adjustments were made in ITGS. However, the flow of goods in ITGS have to be removed from national accounts.

112. Company F reported the following import and export of goods in ITGS:

Country	Export	Import
Germany	94	140
Spain		11
Japan	25	
US	17	
Switzerland	3	

¹ Note that this case study draws heavily from case study 3.1 in the Guide to Measuring Global Production and that both versions are written by the same author at Statistic Netherlands.

Unknown	14	14
Total	153	165

113. There are several companies in the Netherlands that ultimately belong to the same parent as company F. However, only company F does not have economic ownership of the goods. The problem is that the flow of goods in ITGS is sometimes registered under other group companies.

114. According to the example, the following flow of goods should take place:

- Import from Spain / Puerto Rico 11 million in table above
- Export to Germany 94 million in table above
- Re-import from Germany 140 million in table above
- Export to final customer 45 million in table above

115. Some import of goods from Spain and/or Puerto Rico was missing, because the import value of 11 million euro is very low compared to the export to Germany of 96 million euro.

116. It turned out that the missing import values were reported by a group company in the Netherlands who reported 31 million euro imports from Spain and 44 million euro from the US. After this finding, the import of goods from Spain and the US for the group company was also removed from the national accounts.

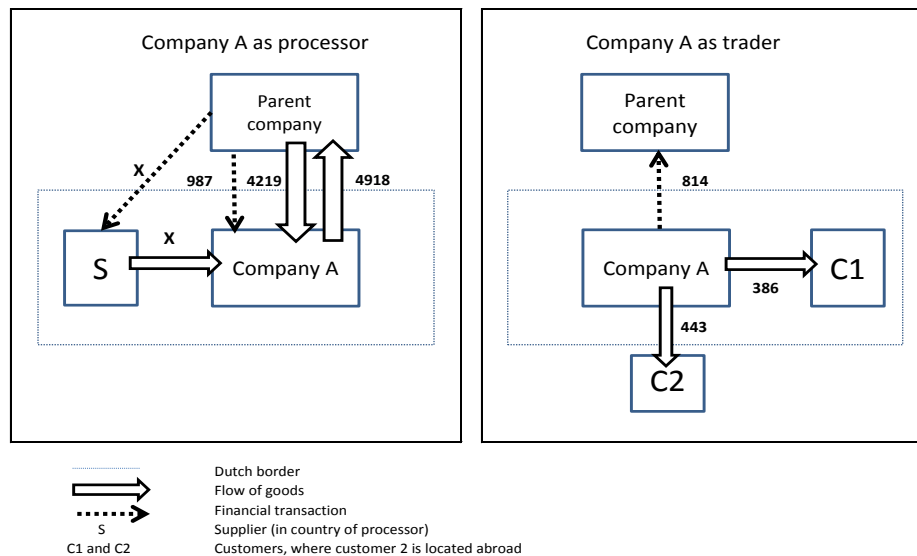
VI. Global production arrangements in the Dutch national accounts

117. This section shows how three of the case studies from the previous section should be registered in the Dutch national accounts according to the guidelines provided in chapter 5 of the Guide to Measuring Global Production and shows the challenges faced in complying with these guidelines.

A. Inward processing (case study 1 in section V)

118. Company A transforms material inputs into chemical products for the non-resident parent company. Company A receives a fee for the processing services. After processing, company A purchases a share of the processed goods from the parent company and sells these goods on own account to resident and non-resident customers. Thus company A is acting both as a processor and a wholesale trader in the supply chain.

119. The transactions of company A are shown in the figure below. The transactions relating to the processing arrangement are depicted on the left and those relating to the trading activities are depicted on the right. The values reported in the figure are taken from table 3 of the previous section. To complete the figure, additional data was taken from the annual report of company A in which a breakdown is given of the goods sold on own account by company A (829 million euro) by domestic (386 million euro) and foreign sales (443 million euro). Note that the outflow of processed goods (4918 million euro) is derived by subtracting the value of goods exported on own account by company A (443 million euro) from the outflow of goods reported in ITGS (5361 million euro) as indicated in table 3.



Company A as a processor

120. The following international transactions have to be measured and adjusted in the national accounts:

- Export of processing service
- Removal of import of raw or intermediate goods
- Removal of export of processed goods
- Export of raw materials/intermediate goods

Export of processing service

121. In national accounts ITSS is the source statistic for measuring export of services. Company A reported 987 million euro in export of processing fees in the ITSS. This matches the fee earnings reported in the SBS.

Remove import of material inputs from ITGS

122. All imports of goods (4219 million euro) are removed from the ITGS since there is no transfer of ownership of these goods.

Remove export of processed goods from ITGS

123. All exports of goods have to be removed from ITGS, except those goods that are sold on own account by company A (443 million euro). In total 4918 million euro is removed from the exports in ITGS.

Export of material inputs

124. The material inputs that are purchased by the parent company and delivered by the resident supplier to company A, should be recorded in the national accounts as an export of goods. These goods are not registered as exports in ITGS, because they do not cross the Dutch border.

125. The value of the goods delivered by the resident supplier to company A is not registered in SBS, STS or SFO of company A, since the latter does not obtain ownership of the goods. The value is estimated using the following relationship:

Equation 1) Value of material inputs + processing fee = Value of the processed goods

The value of the material inputs is the sum of the inflow of material inputs from the country of the principal (4219 million euro) and the value of material inputs from the domestic supplier (X).

The processing fee is 987 million euro.

The value of the processed goods is the sum of the outflow of processed goods from company A to the parent company (4918 million euro) and the value of the processed goods purchased by company A from the parent (814 million euro).

Inserting these values in equation 1 yields:

$X = \text{Value of processed goods} - \text{processing fee} - \text{inflow of material inputs from abroad}$

$X = (4918 + 814) - 987 - 4219 = 526 \text{ million euro}$

Company A in its capacity as trader

126. The following international transactions have to be measured and adjusted in the national accounts:

- Import of goods that are purchased for resale
- Export of wholesale trade goods
- Domestic sales of wholesale trade goods

Import of goods that are purchased for resale

127. Company A purchases 814 million euro of processed goods for sale on own account. Since the goods are already in the possession of company A, the value of these goods is not reported as imports in ITGS. However, the value of these goods is reported as 'purchases of goods for re-sale' in SBS. For national accounts purposes the value of these goods is added to imports of goods.

Export of wholesale trade goods

128. The export of wholesale trade goods is reported in ITGS by company A, but together with the processed goods that are returned to the parent. Therefore we cannot use ITGS to estimate the value. Fortunately the value of the export of wholesale goods is reported in the annual report of company A (443 million euro).

Domestic sales of wholesale trade goods

129. In SBS the total value of sales of wholesale trade goods is reported (829 million euro). To estimate the value of domestic sales we deduct the value of exports of wholesale trade goods (443 million euro) from the value of total sales. This yields a value of 386 million euro.

B. Factoryless goods producer, registration as trader (case study 4 in section V)

130. Company D is registered as a wholesale trader in the Netherlands. The company purchases brown and white spirits from a non-resident affiliated company and sells the products all over the world.

131. The company reports the following transactions in SBS:

Purchases of goods under merchanting

132. The Dutch SBS makes a distinction between goods purchased for merchanting and goods purchased for other distributive trade. Company D reports a value of 1.180 million euro for goods purchased for merchanting. This value contains the brand specific ingredients purchased for further processing by the non-resident producer (in relation to the production of white spirits) and the purchases of brown spirits.

Sales of goods under merchanting

133. In SBS a value of 2.800 million euro is reported for goods sold under merchanting. This value contains the sales of the brown and white spirits to customers located abroad.

Payment for industrial services

134. The company reports the payment of the blending fee (brown spirits) and the fee for industrial services (white spirits) in SBS. Both are reported as the payment of management fees to the processor and should be recorded as import of services.

Other cost of production

135. The purchase of goods and services used in the production process of company D are reported in SBS and equal 526 mln euro. This includes the purchase of brand specific ingredients used in the production of white spirits.

136. Since the international transactions are not reported in ITGS or ITSS, the values reported in SBS are used to impute them in the national accounts. This leads to the following registration of company D in the national accounts:

<i>Production account</i>	
Production	1.620
Sale of goods under merchanting	2.800
Purchases of goods under merchanting	1.180
Intermediate consumption	726
Industrial services	200
Other goods and services	526
Value added	894
<i>International transactions</i>	
Net export of goods under merchanting	1.620
Purchases of goods under merchanting	2.800
Sale of goods under merchanting	1.180
Import of industrial services	200

C. Factoryless goods producer, registration as manufacturer (case study 5 in section V)

137. Company E sells electronic products and after-sale supporting services to customers located in Europe. The company has an office in the Netherlands with 200+ employees that provide supply chain, sales and IT-services for affiliated companies in the US and Europe.

138. There are no manufacturing facilities in the Netherlands. The products are manufactured by contract manufacturers located abroad. Company E does not own the material inputs, but does control the production process and supplies the blue prints for production. It is a factoryless goods producer and is treated as a manufacturer in the Dutch national accounts.

139. The following table shows how company E is registered in the Dutch national accounts (NA) and which sources are used to compile the figures.

	SBS	STS	ITGS	ITSS	NA	Sources/formulas
Production	9150	9280			9150	= SBS
Interm. consumption	8995				8995	= SBS
Goods	5090				5090	= SBS
Services	3906				3906	= SBS
Value added	155				155	= SBS
Exports		9094			8967	= 9150 x 9094/9280
Goods			570		7713	= 8967 - 1254
Services				1254	1254	= ITSS
Imports					8921	= 5090+3831
Goods			650		5090	= interm. cons. SBS
Services				3831	3831	= ITSS
Trade balance					46	= 8967-8921

140. The production account is derived from the SBS and the import and export of services is derived from the ITSS. For the import and export of goods we cannot use the ITGS, because most goods that are sold by company E to non-residents, do not cross the Dutch border.

141. Therefore, we derive the values indirectly as follows:

When classifying company E as a manufacturer, the value of exports of goods and services is derived by combining data from SBS and STS. The STS contains a breakdown of production by domestic and foreign sales. The value of exports in the national accounts is estimated by multiplying the value of production in SBS by the ratio of foreign sales to total sales in STS.

142. The export of services in national accounts is directly derived from ITSS. The definitions and concepts of ITSS are consistent with the ESA concepts and the values in ITSS have been confirmed by the company.

143. The export of goods is derived as a residual.

144. The import of goods is equal to the intermediate consumption of goods reported in SBS. The latter comprise the value of the finished goods purchased from the contract manufacturers. Since all the contract manufacturers are located abroad, all purchases of finished products are imports of goods.

145. The import of services is directly derived from ITSS.

VII. Concluding remarks

146. This paper shows that implementing the change in ownership rules of SNA 2008 is not straightforward and can be a very time-consuming process. The available statistical sources are not always in line with the requirements of SNA 2008. This leads to inconsistencies between the results of statistical sources. Although these inconsistencies have to be resolved before the results can be used in the national accounts, they can also be useful in detecting global production arrangements.

147. This paper shows that compiling the correct national accounts transactions for the different global production arrangements after they have been detected is hardly possible without extra information from the enterprises involved. Different production arrangements will lead to different inconsistencies between the results of the statistics involved as shown

in table 1 and 2 of this paper. In theory these inconsistencies can help us estimating the correct transaction values. However, the production arrangements presented in these tables are not often found in reality. For example, the case of outward processing described in table 1 and 2, i.e. goods that are sent abroad by the principal to be processed and return to the country of the principal after they have been processed is more an exception than a rule: in most cases not all the raw materials are provided by the principal and not all finished goods return to the country of the principal after processing. The same is true for other global production arrangements.

148. Statistics Netherlands has a Large and Complex Cases Unit, that detects and resolves the inconsistencies for the 300 most complex. Usually this is done by contacting the enterprise to get the information needed. Of course, the appearance of global production arrangements is not limited to the largest enterprises. It is not realistic to apply this method for all enterprises involved in global production arrangements. Statistics Netherlands is investigating the possibilities to estimate the correct transaction values needed with the help of inconsistencies in the data. Also, some new questions have been added to questionnaires to get the required information. This work is not completed yet and a lot of research has yet to be done.

149. Many countries face difficulties in compiling national accounts figures according to the new SNA 2008 concepts. We hope that this paper contributes to the further development of statistical methods that enable statistical offices to describe the economic reality of a globalising world in a better way.