

Session 8A: How to Capture Multi-Nationals in National Accounts
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**Norwegian Units Involved in Global Manufacturing:
Some Practical and Principal Problems**

Trude Evensen and Tore Halvorsen

For additional information please contact:

Name: Trude Evensen
Affiliation: Statistics Norway

Email Address: Trude.Evensen@ssb.no

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Contents

- Contents..... 2
- 1 Introduction..... 3**
- 2 Principles..... 3**
- 3 Coverage of national incomes and costs in sources used for calculation of output, value added, export and import in the Norwegian NA 4**
 - 3.1 Structural Business Statistics..... 4
 - 3.2 Balance of Payments (BOP)..... 4
 - 3.3 Statistics on external trade in goods 5
 - 3.4 Statistics on external trade in services 5
- 4 Outsourced production – what do we know? 6**
 - 4.1 PRODCOM 6
 - 4.2 Labelling companies and establishments in the Norwegian Business register..... 8
 - 4.3 Information about goods sent abroad for processing and processed goods in the statistics on external trade of goods 8
 - 4.4 Information about processing fees in the statistics on external trade of services 9
 - 4.5 Sourcing-surveys 9
- 5 Analysing microdata 10**
 - 5.1 Selected data and units 10
 - 5.2 The largest units reporting production abroad in PRODCOM..... 11
 - 5.2.1 Units in manufacture of machinery and equipment n.e.c..... 11
 - 5.2.2 National units in the branch building of ships, oil platforms and modules 13
 - 5.3 Units with no remaining manufacturing production in Norway..... 14
 - 5.4 National units providing services on a global market 15
 - 5.5 Conclusions based on the study of micro data for selected national enterprises 16
- 6 Final remarks 17**
- References: 19**

1 Introduction

SNA 2008 and BPM6 provide new guidelines on how to record processing and merchanting activities. The new key is change of economic ownership instead of physical movement of commodities. Being a small, open economy, Norway has many enterprises involved in global manufacturing, as well as some global service providers. In the last years there has been an opportunity to mark national enterprises involved in global manufacturing in the Central Business Register, however this opportunity has not yet resulted in an overview of all such enterprises. A project was initiated in 2011 to look into practical and principal problems in capturing national production, value added, export and import from national units involved in global manufacturing. It is clear that globalisation also causes principal and practical problems in capturing national employment and gross fixed capital formation, however this have not been focussed in this study.

For a few enterprises with production abroad, micro data from trade statistics and the link to structural statistics has been studied. Analysing the economic behaviour of these enterprises and presenting some simple data examples, the project seeks to outline what kind of extra data is needed to implement the recommendations on how to value production, export and import according to 2008 SNA and BPM6.

2 Principles

As pointed out by others, global manufacturers organize their production in many different ways, e.g. *United Nations (2011)*. International recommendations for national accounts (SNA and BPM) describe the treatment of global production in terms of two main models: goods sent abroad for processing and merchanting. The updated SNA (2008) and BPM6 have changed the recommendations on how to record processing and merchanting. Economic ownership is now the key, instead of physical movement of goods.

However, the “standard example” for goods sent abroad for processing, where a principal in Norway sends raw material out of the country to be processed in another country, and receives finished goods in return (as explained in chapter 5 in *United Nations, 2011*), is not be the most typical example of how the Norwegian economy is influenced by global production arrangements. More typical would be that the Norwegian enterprise arranges for production in for example an Eastern European country, with raw materials bought in Asia, and sells the finished products to continental Europe and the USA. The research and development activities take place in Norway, and the enterprise’s annual financial accounts include sales income etc also from the activities abroad. It is not clear from the detailed financial reports if the Norwegian enterprise owns the material input or not. According the recommendations, goods which are transformed or processed while in the economic ownership of the Norwegian entity should be recorded under goods for processing heading “manufacturing services on physical inputs owned by others” in the services accounts.

If the Norwegian entity only purchases goods from country X for sale in country Y the goods change economic ownership, but do not physically enter the economy where owner is resident. By convention, the acquisition of the goods intended for resale should be shown as negative exports. When sold, the goods should be recorded (positive) exports (2008 SNA, para 14.73). Hence, the challenge is to clarify whether the principal owns the goods throughout the processing, or buys them in a finished state.

To categorize the different organisation models found in global manufacturing according to principles of the 2008 SNA and BPM6, is however not easy in practice. We will come back to this.

3 Coverage of national incomes and costs in sources used for calculation of output, value added, export and import in the Norwegian NA

3.1 Structural Business Statistics

The annual structural business statistics is the main source for calculating figures for output, value added, compensation of employees and gross fixed capital formation in manufacturing industries, as well as in most service industries, in the annual national accounts. The structural business statistics is based on data from administrative registers and some additional information from questionnaires reported to Statistics Norway. The administrative registers contain copies of the standard financial reports which tax authorities collect from the enterprises (the Standard Industry Form). The questionnaire covers, among else, information about variables as sales revenues, compensation of employees, and other costs, specified by local kind-of-activity units within the enterprise.

In relation to the study of national coverage and transactions to rest of the world, the split by local kind of activity units is less relevant. It is the reported figures for sales revenue and other incomes for the reporting enterprise in the Standard Industry Form that is the basis for calculation of resident output. Intermediate consumption as well as consumption of employees and gross fixed capital formation is also collected from the financial reports.

An internal working group was set up in Statistics Norway in 2011 because it was suspected that some of the financial statements included revenues and costs related to production abroad.

The internal working group concluded that:

- Structural Business statistics includes revenues and costs from activities abroad
- Thus output and intermediate consumption in the Norwegian NA includes output and intermediate consumption that according to ESA95 and 1993 SNA should be recorded as non-resident.
- How much? The data are too weak to tell
- Value added (and GDP) may accordingly be affected
- The inclusion of income from production abroad creates imbalances between domestic output and exports (also inconsistency regarding costs and imports as now goods and services are crossing the borders).
- The recording in the Structural business statistics seems to be more in line with updated international recommendations in 2008 SNA. However in practice we might still find that the coverage of reported revenues and costs in the Structural business statistics for some units depart from the recommendations in the (updated) SNA. For example we might find that some Norwegian enterprises include revenues and costs in their Standard Industry Form which are related to activity in affiliates abroad, and where these affiliates according to SNA should be treated as non-resident units.

However, the *level* of revenues and costs related to the production abroad are unknown. Therefore there has been no adjustment of incomes and costs related to production abroad in the Structural business statistics and thus in the national accounts.

3.2 Balance of Payments (BOP)

In Norway BOP is integrated in the national accounts (NA). The division for national accounts is responsible for compiling both NA and BOP figures. BOP figures for exports and imports of products

are a part of, and consistent with figures for exports and imports of products in the NA supply and use tables. The main sources for calculation of exports and imports in the NA and BOP are:

- Statistics on external trade in goods
- Statistics on external trade in services

3.3 Statistics on external trade in goods

The statistics on external trade of goods for Norway is based on customs declarations for goods that cross the border of the country. Beyond this, figures for exports of crude oil and natural gas are based on reports from the enterprises operating the petroleum fields, terminals and pipelines, and the Norwegian Petroleum Directorate..

Since the main principle is that the goods have to cross the border to be registered as import or export in the administrative system, it follows that the export of goods does not include sales to non-residents if the good is produced abroad and transported directly to the customer's country. This creates an imbalance between domestic output and exports since revenues related to this production might be included in the reported sales revenues in the structural business statistics. Likewise the import figures will not include payments to non-residents related to the production abroad, even though these costs might be included in the reported costs in the structural business statistics.

This means that the coverage of exports and imports in the external trade of goods statistics is not consistent with the reporting of incomes and costs related to production in the Structural Business Statistics. The coverage of exports and imports follows the international principles in ESA 95 and 1993 SNA. However, it will not be in line with the updated principles in and 2008 SNA.

3.4 Statistics on external trade in services

The Norwegian statistics on external trade of services is based on a quarterly survey of domestic non-financial enterprises. The survey asks the national reporting units about imports and exports of services, specified by type of service. The services are defined according to the EU standard Classification of Products by Activity (CPA).

The population in this survey is built on information from the Financial Census from 2003, the foreign payment statistics from the Central bank of Norway from 2004 (the last production year) and Central Register of Establishments and Enterprises. The population is updated by the use of different administrative registers, such as the Register of Cross border Transactions and Currency Exchange, information through contact with the largest reporting enterprises and information through media.

The instructions for reporting in the survey states that all services including trade delivered to the reporting enterprise by companies, affiliates, legal persons or other units regarded as foreigners, and for which payments are made to the counterparts are regarded as imports.

All services including trade delivered from the reporting enterprise to companies, affiliates, legal persons or other units regarded as foreigners, and paid by the counterparts are regarded as exports.

Trade in services with foreign affiliates within the same reporting group shall be included in the reports in the same manner as other trade in services with foreign companies, specified with type of service (CPA-code). Such trade in services must also be specified in individual items. In this context, "group" means units with a certain relationship, such as parent company, subsidiaries, and branches, etc.

From this it follows that the coverage of exports and imports in the external trade of services statistics complies with the updated international principles in 2008 SNA. In principle the recording of exports

and imports of services in the survey should also be consistent with the reporting of revenues and costs related to production in the Structural Business Statistics. However there might be inconsistencies, for example due to some national enterprises with affiliates abroad (see section 3.1).

4 Outsourced production – what do we know?

4.1 PRODCOM

The manufacturing statistics includes an annual survey on production and use of certain commodities, labelled PRODCOM. The PRODCOM sample cover all large¹ enterprises with local KAUs in manufacturing, mining and quarrying, representing 90 per cent of the total production. Questionnaires on output (based on sales) and use of specified commodities are sent to the respondents.

From 2008 the survey includes a question about production abroad. The question is: *How large part (percent) of the reported turn-over is sales of goods produced abroad?*

Table 1 shows the main results from the PRODCOM- surveys on production abroad for the accounting years 2008, 2009 and 2010. For the accounting year 2010 there were 532 enterprises, of 2169 respondents, that claimed that some, or all, of the reported output were produced abroad. In total, *about 10 percent of reported sales were reported as production abroad.*

316 respondents did not answer the question, and the quality of the reporting is unknown. Thus, there is some uncertainty in the data. There has been, however, an analysis of whether the reporting of production abroad seems stable from year to year, and stability in the data has been confirmed.

Table 1 Main results from PRODCOM related to reporting of production abroad			
	2008	2009	2010
Number of units			
- reporting units, in total	2320	2265	2169
- units not answering question about production abroad	462	363	316
- units answering that there are no production abroad (output is in its entirety domestically produced)	1364	1375	1321
- units answering that some of, or all, output is produced abroad (> 0 %)	494	527	532
Output, billion NOK			
In total	646	589	609
Of this: produced abroad	34	59	57

Table 2 shows production abroad in per cent of total reported output for different manufacturing and quarrying industries. We see from the table that all these industries² are involved in production abroad. Production abroad seems to be most significant in the industry groups *Manufacture of wood and wood products* and in *Manufacture of motor vehicles, trailers and semi-trailers and transport equipment*.

¹ The cut-off limit has been set to 10 employees in some divisions, and to 15 or 20 in other divisions.

² Standard Industrial Classification (SIC 2007) is a national statistical standard based on the European Classification of Economic Activities, NACE Rev.2 (*Statistics Norway, 2007*)

Even though many enterprises contribute to production abroad, the largest enterprises dominate in value terms:

- The 10 largest units with output abroad, contributed to 59 per cent of the total value of output abroad.
- The 3 largest with output abroad, contributed to 41 per cent of total value of output abroad

Table 2. Production abroad as per cent of total output by industry. 2008-2010

		2008	2009	2010
Total ¹⁾		5,3 %	10,1 %	9,4 %
Total for units which have reported figures ¹⁾		6,3 %	11,5 %	9,8 %
<i>SIC 2007²⁾:</i>				
05,07,08,09.9	Mining and quarrying	29,6 %	36,5 %	37,5 %
10-12	Manufacture of food products, beverages and tobacco	2,0 %	99,0 %	24,2 %
13-15	Manufacture of textiles, wearing apparel, and leather	11,3 %	5,7 %	11,1 %
16	Manufacture of wood and wood products	65,3 %	62,1 %	63,4 %
17	Manufacture of paper and paper products	22,1 %	20,8 %	32,6 %
18	Printing and reproduction of recorded media	24,8 %	50,1 %	43,4 %
19-21	Manufacture of refined petroleum, chemical and pharmaceutical products	7,9 %	18,7 %	13,0 %
22	Manufacture of rubber and plastic products	47,7 %	28,9 %	18,4 %
23	Manufacture of mineral products	11,5 %	15,6 %	13,1 %
24	Manufacture of basic metals	18,8 %	9,6 %	22,3 %
25	Manufacture of fabricated metal products, except machinery and equipment	7,8 %	9,0 %	19,5 %
26-27	Manufacture of computer, electronic and optical products and electrical equipment	13,3 %	20,6 %	14,3 %
28	Manufacture of machinery and equipment n.e.c.	36,9 %	31,9 %	33,5 %
29-30	Manufacture of motor vehicles, trailers and semi-trailers and transport equipment	44,0 %	73,5 %	62,5 %
30.1	Building of ships, oil platforms and moduls	64,9 %	49,6 %	35,6 %
31-32	Furniture and other manufacturing n.e.c	19,2 %	15,7 %	28,7 %
33	Repair and installation of machinery and equipment...	36,2 %	40,5 %	38,6 %

¹⁾ The total is an estimate, based on assumptions about the share of output produced abroad for those units that did not answer the question, and for those that have reported.

²⁾ Standard Industrial Classification (SIC 2007) is a national statistical standard based on the European Classification of Economic Activities, NACE Rev.2 (*Statistics Norway, 2007*)

Measured in value terms, the production abroad is most significant in *Manufacture of machinery and equipment n.e.c. (SIC 28)*, as well as in *SIC 29-30*. Included in this group is *Building of ships, oil platforms and modules*. The largest companies with production abroad in these branches supply different products, as well as some services, mainly to oil and gas extracting companies (in Norway and globally).

From our point of view, it would be useful if the survey also included questions about the organisation of the output abroad. Presently, there is no way that we can decide whether the production abroad fits with the processing model (either goods sent abroad for processing or production abroad without any goods crossing the national border), or with merchanting. However, since the companies included in the list also report sale revenues, it might be reasonable to assume that the production abroad is not sourced out to a subsidiary which gets the full responsibility of the production (direct ownership).

4.2 Labelling companies and establishments in the Norwegian Business register

In the last years there has been an opportunity to mark national units involved in global manufacturing in the Norwegian Central Register of Establishments and Enterprises (the business register, for short) with a specific code. The coding is based on the information received through the PRODCOM survey, information in the companies' annual reports, as well as notices in the media. Per 2012, only about 30 enterprises were marked with output abroad.

So far, the marked units are only companies where nearly all, or most of, the reported sale revenues come from production abroad. There is also a possibility that the marking of the relevant units in the register is not sufficiently updated.

Only units belonging to the manufacture industry have been considered for inclusion in the list. This means that the units in the list add up to only a *minimum level* of production abroad. After first assigning the type code, the industry code has been reconsidered, and for some of the units the industry code was changed, mostly from manufacturing to the wholesale trade industry.

The list has not been used to adjust values according to production abroad in the structural business statistics, nor in the national accounts.

In our point of view, the list is presently not sufficiently exhaustive, since it;

- does not include all units with production abroad, and
- units in service industries are not included.
- includes no information about organization of the production abroad: Should it be treated as processing or merchanting (or neither of these models)?

4.3 Information about goods sent abroad for processing and processed goods in the statistics on external trade of goods

The statistics on external trade of goods includes procedure codes that are supposed to be used for goods that are sent abroad for processing and for reimported goods after processing. In theory, this could have given us information about

- goods sent out of the country for processing (the total amounts in NOK, what kind of goods and – on a micro level- which units that export them).
- re-imported goods after processing (the total amounts in NOK, what kind of goods and – on a micro level- which units that import them).
- goods imported to be processed in Norway (the total amounts in NOK, what kind of goods and – on a micro level- which units that import them).
- Goods re-exported after processing in Norway (the total amounts in NOK, what kind of goods and – on a micro level- which units that export them).

However, the procedures are not always followed. An analysis of the results carried out a few years ago found that the data were not rational.

The procedures have been improved, hopefully they may be easier to understand and follow. If so, this will give us an opportunity to get relevant information in the future.

4.4 Information about processing fees in the statistics on external trade of services

If a resident unit sources out production to an unit abroad, and the organisation of the production abroad fits with the model of processing, there should in principle be an import of a processing fee. On the other hand – if a resident unit processes goods for a non-resident unit, there should in principle be an export of a processing fee. Imports and exports of processing services should then be detected in external trade of services statistics.

The Norwegian statistics on external trade of services is, as mentioned earlier, based on a quarterly survey of national non-financial enterprises. The survey asks for :

- **Contract work and other manufacturing services**
with the following recommendations about the contents:
 - **Income:** Export value of payment for contract work and other manufacturing services from non-resident customers. Includes also processing services
 - **Cost:** Import value of contract work and other manufacturing services paid to non-resident suppliers. Includes also processing services

This item *includes* processing services, so the reported figures for imports and exports might be seen as a *maximum level* of imports and exports of processing fees, given the assumption that the level is correctly reported and other statistical uncertainty is not too insignificant.

For the period 01.01.2011 - 30.09.2011 the reported figures for this item were in total:

Exports	Imports
2 282 MNOK	2 108 MNOK

These figures are low, representing less than 1 per cent of total exports and imports of services, according to preliminary national account figures for 2011. It is interesting to see that the reported export figures is larger than reported import figures, since we would presume that the opposite relation would be the reality.³

4.5 Sourcing-surveys

To study some statistical evidence about the level, patterns and possible impact of international sourcing (IS) Eurostat, and the national statistical offices in the Member States launched an ad-hoc study. A sample survey was done in Norway in 2007, and the results published in a joint publication by the statistical offices in Denmark, Finland, Sweden, the Netherlands and Norway (*Statistics Denmark, 2008*). In Norway the survey was sent to 1620 enterprises with more than 100 employees. The response rate was about 85 %. The survey asked for;

- ♦ International Sourcing in the period 2001-2006
- ♦ Plans for IS in the period 2007-2009
- ♦ To which countries?
- ♦ Which functions (Core business functions or support functions)?
- ♦ Motivation for IS
- ♦ Barriers for IS

IS of core functions *may* conform with the concept of productions abroad in PRODCOM. However, it is also possible that production that is moved to daughter companies abroad, and where the subsidiary

³ Other European countries reports the same; reported export figures of processing services are larger than reported import figures, even though one might suspect the opposite for many of these countries.

has full control of the production process and ownership to raw materials and finished goods, in this survey is included in the respondents' interpretation of IS.

Of 777 accepted answers, *about 16 per cent of the respondents answered that they had sourced out core business functions in the period 2001-2006*. Of these, there were slightly more units in manufacturing industries than in service industries. More than half of the IS were to countries within EU, but there was also outsourcing to China, India, and other countries outside Europe.

Even though the survey gives some information about IS, the results can not be used directly to quantify the value of production abroad, and more specifically the value connected to processing and merchanting respectively, because:

- The survey gives no information about *economic values* connected to IS.
- The survey does not include any information about the *organisation of the production that is sourced out*, implying we can not tell whether the reported IS for a specific unit is processing, merchanting or direct ownership.
- The results are uncertain; the number of reporting units is too small to allow good estimates, especially on a detailed level.

A new survey is now being carried out for 2012, and the results will to be published in the late autumn 2012. This new study is sent to all enterprises with more than 100 employees, which means that the sample size is much larger than in the 2007-survey.

Still, the results will not give any information about economic values, but the 2012-survey is broader than in the 2007-survey. Questions are asked about the nature of the core business activity in the enterprise, and employment in Norway is specified by type of activity. This may altogether give information relevant for considering the kind of organisation model that the production activity abroad represents.

5 Analysing microdata

5.1 Selected data and units

As we have no complete overview of resident units with global production arrangements we have put up a list of examples and studied relevant microdata for *some* of the units. The selection of units to be studied in detail is based on :

- The largest units reporting production abroad in PRODCOM, measured on the basis of value connected to the production abroad.
- A couple of examples of units where the industry code has been evaluated after the production were sourced out.
- A few examples of global service providers, where the control and head quarter is in Norway.

The microdata we have studied are collected from the following statistical systems:

- External trade in goods statistics
- External trade in services statistics
- Structural Business Statistics, of this: The copy of the standard financial reports that the tax authorities collect from the enterprises (the Standard Industry Form).
- The companies' annual reports, with the financial statements and explanatory notes

For these data sources, the financial statements or transactions related to a specific enterprise can be identified by organisation number. This is a unique number given to the enterprise when first

registered in the Central Coordinating Register for Legal Entities. The structural business statistics also contain some information about establishments (local kind of activity units) within the enterprise. However, when analysing the dimension of nationality and transactions with the rest of the world, the enterprise units should be appropriate in most cases.

5.2 The largest units reporting production abroad in PRODCOM

As mentioned in section 4.1, the largest enterprises with reported production abroad, are either suppliers of machinery and equipment to oil and gas extracting companies (in Norway and globally), or manufacturing of ships, oil platforms and modules. In both cases oil and gas extracting companies (in Norway and globally) are significant customers.

5.2.1 Units in manufacture of machinery and equipment n.e.c.

The cases we have studied of companies registered with industry code *Manufacture of machinery and equipment n.e.c.* in the Norwegian Central Register of Establishments and Enterprises, provide mechanical components, equipment and tools related to land and offshore drilling rigs, as well as services related to drilling and extraction of oil and gas worldwide. The products are of high quality and usually highly advanced oilfield products and services. The enterprises have own daughter companies abroad and in Norway, and the head offices are located in Norway.

At the same time the national enterprises are also part of large multinational enterprises (MNE). The examples cover both enterprises which is part of a MNE with head office in Norway, and enterprises which is part of a MNE with head office abroad.

From PRODCOM we know that most of reported sales revenues for these units are related to production abroad. Based on contact with the enterprises and description in the enterprises' annual reports, we know that the employees in Norway are mainly highly qualified engineers, occupied with research, design and testing, as well as repairs of machinery and equipment. The research done in Norway is related to development of new products and to improve existing products. The national enterprises promote for, and make sale arrangements of, finished goods to the customers. The actual production of the goods is however mainly sourced out to enterprises abroad.

How is the production abroad organized? Do the enterprises in Norway have the ownership to raw materials used in the production process, and do the national enterprises keep the ownership to the concept and finished goods? Or do they order finished goods, based on specific descriptions? If the national enterprises *do* pay for some of the raw materials, to which extent is this the practice?

For these large enterprises, the production abroad is sourced out to many different producers abroad. The subcontracts may be producers within the same MNE, but not always. The largest enterprise, measured by the value of output related to production abroad, states that different contracts are used. Whether the enterprises pay for raw materials or not may vary, but usually there are *franchising contracts*. They find it impossible to answer to which extent the enterprise pay for input materials in the production process (per cent of raw materials used), because they not have this information available in their accounting system.

An other large enterprise answers that it pays for all the raw materials used in the production abroad.

Studying the relevant microdata for these enterprises, we find that the enterprises' reporting of sales revenues in the Standard Industry Form (SIF), in it's annual financial statements and in PRODCOM,

mostly are consistent⁴. In the explanatory notes notes to the annual financial reports, sales revenues are reported by geographical areas. This makes it possible to separate resident customers from customers abroad. Further, this makes it possible to compare the revenues from customers abroad with the reported export figures from the external trade in goods statistics and the external trade in services statistics.

Since the calculation of output in the national accounts, as mentioned earlier in this paper, is based on the reporting of the sales revenue as reported in the SIF, and the calculation of exports and imports mainly is based on the external trade statistics (goods crossing the border), this means that there will be a discrepancy or inconsistency between calculated output and exports in the national accounts. However since this inconsistency is impossible to identify in the macro figures, it will cause a balancing problem in the national accounts supply and use tables (SUT).

An illustration of the inconsistency problem is given in table 3, which shows the relationship between reported figures in the different sources (for an average nominee company unit, based on the studied examples): Since the example units also supply some services, the declared revenue related to customers abroad to some extent may include export of services in addition to export of goods. The declared sales revenues related to customers abroad therefore must be compared with total exports of goods and services registered in the external trade statistics.

<i>Table 3. Example of a national enterprise with industry code Manufacture of machinery and equipment n.e.c. and with output produced abroad. Reported annual figures in different sources.</i>		
Source	Specification	Amounts in e.g. NOK
PRODCOM:	Production (sales revenues)	9 500
	<i>Of this: Produced abroad</i>	<i>9 000</i>
STI and annual accounts:	Sales revenue (total)	10 000
	Operating incomes	10 000
Annual financial statements, note	Sales incomes, separated geographically:	
	Norway	1 000
	Other European countries	500
	North America	4 000
	Asia	4 000
	Other	500
External trade in goods statistics	Reported export of goods, total	4 000
External trade in services statistics	Reported export of services, total	500
<i>Difference between reported export (external trade statistics) and declared sales revenues from abroad (as found in explanatory notes to the annual reports).</i>		<i>9 000- 4 500 = 4 500</i>

⁴ There are some difference between the reporting figure in PRODCOM and the declared figures in the annual reports and the Standard Industry Form (SIF) especially for one unit) but the deviation is not considered relatively large. The reason for this may be that the concept/definition related to the reported size in PRODCOM is not completely aligned to the definition of sales incomes in the S IF and the annual accounts.

As we can see from table 3, there is major difference between sales revenue from abroad, and reported export. The main explanation for this is that the external trade statistics only cover goods crossing the national border. The goods produced abroad are directly transported to the buyer's country of destination, and not at any point in time crossing the Norwegian border (this is confirmed by the largest enterprise).

The example above shows that domestic production is 10000 and that intermediate consumption of the product, domestically, is 1000. If the product's export-value is 4500, it means that the residual 4500 will be balanced to changes in inventories and statistical discrepancy. And of this, the domestic production is only estimated to 1000. Even though the example above is only an illustration, it is a reality that we in the recent years have faced an increasing discrepancy between output of machinery products and use of the same products.

The next question is: Will it be a similar gap between calculated intermediate consumption and import in the SUT? Knowing how imports are recorded and that the costs are included in the financial reports, and thus recorded as intermediate consumption in the NA, it is obvious that imports are underestimated. Lack of data on the product level, make it, however, impossible to calculate by how much. This depends also on the extent to which the costs related to payments of goods used in production abroad are included in the reported commodity costs in the SIF. The information given in SIF and the financial statements show relatively small commodity costs compared with an average manufacturing unit while the costs of contract works are relatively high.

This brings us back to the question of how the production abroad is organized. As mentioned earlier, the reporting units can not specify to which extent raw materials used in the production abroad are owned (and paid for) by the national enterprise which makes it difficult to decide whether the actual units perform processing or merchanting.

In principle the criteria is *economic ownership*, which may not always be in accordance with legal ownership and/or which unit within a multinational enterprise (MNE) that actually pays for the goods. This makes it even more difficult to decide whether the processing abroad fits with either processing and merchanting.

From the statistics on external trade of services we have seen that the example units report no imports of processing fees (Contract work and other manufacturing services), see section 4.4. The reason for this might, however, be the enterprises' interpretation of the guidelines when allocating the costs to different services and does not prove that the actual units are not involved in processing. Imports of services in the enterprises involved in production abroad in total are also considered rather low. When questioning one of the enterprises about this, the answer was that they tend to use their own employees to supply services related to the production abroad. Hence, the enterprise sends employees from the domestic Norwegian production unit to different destinations in the world.

However, *it should in theory* be possible for the enterprises, based on information in their accounting systems, to specify costs related to payments to foreign suppliers in the same way as they specify sales revenues from foreign customers. In principle, this is nearly the same as they do when reporting to the external trade statistics of services. However, this would represent an increased response burden for the enterprises.

5.2.2 National units in the branch building of ships, oil platforms and modules

Building of ships and – from the 1970s – also building of oil platforms and modules, traditionally has been a major part of the manufacturing industry in Norway. In the latest decades, an increasingly part of the production has been sourced out to other countries, for instance the ship's hull is produced in Poland, towed to Norway and finished domestically. The national enterprises in this branch may own and operate more than one shipyard, in Norway and in other countries, and/or they buy services from

foreign shipyards (subcontractors). In the latter case it is clear that the Norwegian enterprise owns the right to the design, but it is not clear whether they also have the ownership of the hull.

The reported production abroad, as per cent of total reported output in PRODCOM, is high but has decreased (see table 2). The industry is, however, an important and significant part of manufacturing totally.

Available information from the existing data sources and what we do *not* know is analogous with the previous example, and this brings us also to the same main conclusions.

However, it is relevant to add that the national enterprises responsible for building of ships, oil platforms and moduls may act in a similar way as project vendors: The hull (as a hole or in parts) is usually produced abroad by a subcontractor (which may be an affiliate within the same MNE, or in an unit not connected to the enterprise) and is towed to Norway. Also machinery, equipments and other parts may be produced abroad. On the shipyard in Norway (or at a shipyard in another country) the different parts are put together by different subcontractors. A subcontractor could hire workers from for example Poland to do most of the mechanical work. The major and growing part of the employees in Norway are highly qualified engineers that are working with research and design etc, and coordinating the process and perform other administrative services. More than half of the employees in manufacturing are “white collar” employees.

This indicates that principle and practical problems relating to recording the activity of project vendors are also relevant to these companies.

5.3 Units with no remaining manufacturing production in Norway

Finally, we have looked at two different national units which previously had manufacturing production in Norway, but in the recent years have sourced out the entire manufacturing production to units abroad. Both these enterprises develop and sell advanced communication equipment, The first enterprise has sourced out production to a daughter company in an Eastern European country, while the second enterprise use several independent contractors in different countries. Both companies state in their annual reports sales revenues from customers in various countries, and the sales revenues from Norwegian customers constitute less than 10 per cent.

Both enterprises have earlier been contacted about the ownership to raw materials in the production process. The first company answered that the national enterprise never has had any ownership to raw materials used in production abroad. The second company answered that about 20 per cent of the raw material is acquired and paid by them and send to the contractors abroad that perform the installation works. The rest (80 per cent) of the raw materials used in the production is acquired and paid by others.

There are similarities in the goods these enterprises offer to the market, but to some extent they have chosen different ways of organising the production abroad. The first enterprise declares no ownership to the raw material in the production process, while the second states that they own a minor part of the raw material. The first of these enterprises has been kept with within the manufacturing industry in the business register, while the latter has been moved to the retail and wholesale trade industry. The choices made by the business register regarding classification of the units, is by our opinion questionable, in spite of both similarities and dissimilarities.

Beyond this, the data situation – and the conclusions based on studying micro data for these enterprises – do not distinguish much from what we have pointed out in previous sections, except that the unit registered in the wholesale and retail trade industry is not included in the population to the PRODCOM survey.

5.4 National units providing services on a global market

Even though this study deals with global manufacturing, we have also included a few global service providers, in order to look into similarities and differences to global manufacturers. The example units are all registered within the industrial division *71 Architectural and engineering activities; technical testing and analysis* in the Norwegian Business register.

Two of the units are registered with the more detailed industry code *Technical testing and analysis*. The largest company is a MNE with 300 offices in 100 countries all over the world and with the main office in Norway. The MNE helps companies all around the world to control risks related to business, operational, technical and community relations. Units within maritime industries or energy supply are in focus.

The third enterprise describes itself as a “knowledge based engineering company where the means and value is connected to the intellectual capital”. The enterprise is a part of a MNE with head office in Norway, and it delivers, among else, project leading services and product development, also to unit within the same MNE.

In theory, as pointed in section 3, the concepts for recording of import and export of services in the statistics on external trade in services should be in line with the international recommendations and also with reporting of sales revenues in the Standard Industry Form and annual financial statements. However, in practice there may be challenges connected to capturing national transactions and national activity also related to global service providers. Problems may occur in relation to, for example transfer pricing and net recording within affiliates or offices within the same MNE. We have also discovered that the recording of sales revenues in the financial reports sometimes cover also revenues from production abroad. The conclusion is that the challenges are more or less similar independent of the enterprise being a manufacturer or a producer of services. However, units registered in service industries in the Norwegian business register are not part of the population to the PRODCOM survey, so no data about production abroad are available.

The largest company states, in contact with Statistics Norway, problems to limit the transactions to some national unit, because:

- Organisation structure within the MNE cross the legal structure
- Technical expertise and support functions are delivered internally in the MNE
- Research, development and development of services is performed centrally, but are available to all units within the MNE
- International contract can be entered both in local offices and in central units within the MNE.
- Recovering of payments from customers worldwide is centralised in the MNE.
- Financing of subsidiaries

In total this means a great volume of internal and external transactions across the national borders.

For a couple of the service suppliers we have the studied, the declared sales revenues from customers abroad, according to information in the explanatory notes to the annual reports, is minor than the reported export of services in the statistics on external trade in services. This is the opposite result of what we found about the relation between declared sales revenues from customers abroad and reported export in statistics on external trade for the other selected units in our study. However, regardless of positive or negative differences between the figures from the two different data sources, the existence of a significant difference indicates problems with capturing the domestic activity also for global service providers.

5.5 Conclusions based on the study of micro data for selected national enterprises

- *Domestic output vs exports*
 - The largest enterprises with production abroad have customers both in Norway and in (many) other countries, and goods sent to customers in other countries may never cross the Norwegian national border.
 - Reported sales revenues from customers abroad do not fit with reported export in the external trade of goods statistics.
 - The discrepancy between calculated output and exports in the annual national accounts for domestic units with production abroad may be significant and causes balancing problem.
 - This discrepancy is independent of the change of principles due to processing in SNA/ESA. However, according to 1993 SNA output should be corrected whereas according to 2008 SNA export figures should be corrected.
 - The information about sales by country of the customer can be used more systematically in the statistical system. However, it will be more resource demanding to do so (either for the national statistical office, or for the reporting units).
- *Intermediate consumption(costs) related to production abroad vs imports*
 - There is a discrepancy between costs (intermediate consumption) and imports as well, but existing data can not tell by how much.
- *Processing or merchanting?*
 - The national enterprises can not specify to which extent they pay for intermediate input used in the production abroad.
 - It is even more challenging to make a decision about *economic ownership* to the raw material used in the production abroad.
 - The enterprise with the largest reporting of sales revenues from production abroad states that the contracts with the suppliers abroad usually follow a *franchising model*.
 - Following from this: It is not possible to make a proper distinction between processing abroad and merchanting for all national units with production abroad.
- *Registration of industry code (SIC 2007) in the Central Register of Establishments and Enterprises*
 - If the production abroad is considered as merchanting, and most of the sales revenues are connected to production abroad, then the actual unit in principle should *not be considered as a part of manufacturing industry, but as an unit in the wholesale and retail industry*. But where should we put the limit? The study shows that for rather similar enterprises with slightly different production arrangements abroad, some of the units are classified as manufacturing units, while others are classified as wholesale and retail industry. At the same time, there are also examples of units with similar kind of production and organisation of production abroad that have been classified in other service industries. This proves that the classification rules need to be improved and that criteria of economic ownership of raw material are not easy to follow in practise. There is also debated internationally if it is reasonable *in principle* to classify enterprises that arrange for production of goods and take the entrepreneurial risk of producing and bringing goods to the markets as service providers. Annex 8.2 in *United nations (2011)* informs that the US Office of Management and Budget (OMB) for the 2012 revision of the North American Industry Classification System (NAICS) recommends that factory less goods providers should be classified in the same industries as integrated manufactures and manufacturing service providers. There is need for establishing more clear limits.
- Regarding data sources for exports and imports
 - Furthermore, we do not have access to the data needed to compile exports and imports regarding processing and merchanting in accordance with the recommendations in 2008 SNA.

The selected examples of enterprises do all have sourced out parts or all of their production to units abroad. However global manufacturing also goes the other way: National enterprises may be suppliers to principal enterprises abroad. *Inward processing* will also demand information to correct export and import data so that recorded export and import in the BoP and national accounts are in line with the international recommendations (see section 3.3).

6 Final remarks

The new international recommendations in 2008 SNA and BPM6, which underlines the ownership principle, makes figures in the enterprises financial statements and in the Standard Industry Form more in line with the recommendations related to domestic activity. In principle, this means that it not would be necessary, in the same extent as with recommendations based on 1993 SNA, to correct figures from the Structural business statistics when compiling national account figures for output and intermediate consumption.

On the other hand we will have to correct figures from the statistics for external trade in goods when compiling (BOP and) national accounts figures for exports and imports. In Norway additional data are needed to implement the guidelines regarding exports and imports of merchanting and goods sent abroad for processing.

In addition we still need to investigate whether the coverage of reported revenues and costs in the Structural business statistics for some specific units within MNEs depart from, or are consistent with, the recommendations of domestic transactions in the (updated) SNA.

Altogether the new recommendations do not seems to make the compiling of transactions between domestic units involved in global production and rest of the world any easier.

The recommended recording of processing and merchanting in the national accounts require a system for following up on individual producing units and estimations based on detailed information from each single unit:

First it requires a method of registration of domestic producing units involved in global production in the Norwegian Central Register of Establishments and Enterprises. The register should be able to track all units with sales revenues from production abroad, not only those classified as manufacturing. Especially should wholesale and retail trade units be traced, since many of these will be involved in merchanting. Also for other service producing industries it might be useful to register and mark units with significant sales revenues from customers abroad.

A clear set of rules is needed to classify the units into processing units or merchanting units. Consequently, also detailed information is needed to be able in an operative way to make this classification.

Finally, individual information in order to compile estimations and adjustments in the national accounts are required. To record export and import of goods in the BoP and the national accounts, according to 2008 SNA, the following micro corrections to data from the external trade statistics must be made:

- 1) If the domestic unit has production abroad and ownership to raw materials:
 - Sales revenues related to goods produced abroad and sold and transported directly to non-resident customers (goods never cross the national border) must be added to export data.

- Raw materials paid for by domestic units to non-resident suppliers, used in the production abroad (goods never cross the national border) must be added to import data.
- Reported export value related to goods sent abroad for processing (goods cross the border, but involves no change of ownership) must be deducted from export data
- Reported import value related to goods returning after processing abroad (goods cross the border, but involves no change of ownership) must be deducted from import data.

If inward processing (principal non-resident and supplier resident):

- Reported export value related to goods sent abroad after inward processing (goods cross the border, but involves no change of ownership) must be deducted from export data.
- Reported import value related to goods sent from non-resident units to be processed by domestic suppliers (goods cross the border, but involves no change of ownership) must be deducted from import data.

2) If merchanting:

- Acquisition of goods (costs) intended for resale (not crossing the national border) should be recorded as negative exports
- Income from sales of goods (not crossing the national border), should be recorded as exports

The first priority in the national accounts SUT must be to get figures for exports and imports consistent with figures for domestic output and intermediate consumption, and secondly to implement the correct recording of processing and merchanting (even though these two aims are connected).

It is clear that procedures as described above, with adjustments at micro level, will have high costs both in terms of resources used by the statistical institutes and increased response burden of the enterprises involved. In times when focus is on cost efficiency, alternative strategies for making reasonable adjustments in the national accounts should be evaluated.

One strategy may be to make adjustments to the external trade statistics at a macro level based on an assessment of the information available. However, since we already have stated that the available information is incomplete, especially at a macro level, this strategy will be far from satisfying.

A strategy that would be something between adjustments at micro level (drawback: resource demanding) and adjustments at macro level (drawback: less accurate) would be to keep close contact with the companies with the most extensive transactions (or sales revenues) related to non-resident customers. The priority could be to establish consistent figures for these units, while corrections are done at a macro level for remaining units.

Some countries, have established some kind of big enterprise groups within their national statistical offices to keep close contact with big national enterprises/MNEs and make sure that the reported data to various statistics are consistent.

A theoretical alternative to correct the existing data from the existing statistics on external trade in goods (based on custom declarations) would be to use an alternative data source to establish total figures for export and import in the BOP and national accounts: Enterprises, which already report sales incomes and costs figures could theoretically also be asked, in the same reports about *of this* sales revenues from non-resident customers and *of this* payments to non-resident suppliers, respectively. This kind of information seems to fit better with the information that exists in the enterprises' accounting systems. This would however imply an increased response burden for the enterprises, and therefore this alternative do not seems very realistic.

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