Recording Factoryless Goods Production Arrangements in the National Accounts

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Paper Prepared for the IARIW-OECD Special Conference: "W(h)ither the SNA?"

Paris, France, April 16-17, 2015

Session 6: National Accounts in a Globalizing World
Friday, April 17
9:15-10:30

Discussant: Nadim Ahmad (OECD)

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Abstract: The UNECE Task Force on Global Production recently finalised a first version of the Guide to Measuring Global Production. This paper presents those parts of the Guide dealing with factoryless goods production arrangements. Factoryless goods producers outsource all aspects of material transformation while managing the global value chain and providing critical services inputs derived from intellectual property investment (e.g. R&D, Software, product designs). Current international accounting standards are inconclusive about whether factoryless goods producers should be classified as (special cases of) goods manufacturers or as distributors. The Task Force made an attempt to clarify the nature of transactions that take place between factoryless goods producers and the (foreign) contract producers. Although the Task Force has not been able to bring all issues related to factoryless production to firm conclusions during various international consultations, it has been successful in obtaining a far better understanding of this form of global production. This knowledge should be the starting point for improving the coverage of factoryless goods production arrangements in updated versions of the international national accounting standards, preferably based on further examination of case studies. This paper summarises the discussion on factoryless goods production arrangements in the Guide and explores areas of future research. One of the suggested future actions is the continued exchange of case studies (further collection of evidence) and their discussion at international statistics expert groups in terms of further establishing the appropriate accounting methodology.

* This paper presents the main findings of the UNECE Task Force on Global Production as reflected in the UNECE Guide to Measuring Global Production. Contributions from all Task Force members are gratefully acknowledged. The authors only are accountable for any mistakes in this paper. Readers are invited to provide their comments to mark.dehaan@cbs.nl.

1. Background

1. In recent years, significant steps have been taken to improve international accounting standards with respect to recording transactions of enterprises participating in global production in national accounts and balance of payments statistics. These steps include harmonizing the System of National Accounts 2008 (2008 SNA) and the International Monetary Fund's (IMF) Balance of Payments and International Investment Position Manual, sixth edition (BPM6), recording imports and exports on a strict change of ownership basis and giving guidance on the treatment of merchanting.

2. The new standards are brought in line with several aspects of globalization but also bear many measurement challenges. These measurement challenges triggered new conceptual issues and measurement related questions, which are addressed in the "Guide to Measuring Global Production" (hereafter "the Guide"), developed by the Task Force on Global Production (TFGP). The purpose of the Guide is to support the implementation of the updated international standards and thereby enhance international comparability.

3. The objectives of the Guide are twofold. The first goal is providing guidance on a number of unresolved conceptual issues arising from 2008 SNA and BPM6 in relation to global production. The second goal is to develop further guidance on aspects of implementation. In doing so, the Guide shows existing practices of countries in relation to various types of global production arrangements. The main characteristics of the various forms of global production are discussed on the basis of the global production arrangement typology, developed by the TFGP. This typology may assist in identifying how much control (and the associated risk) a lead enterprise has over the production process. This information is required for national accountants and balance of payments compilers to understand the nature of transactions taking place inside global value chains. For each product or asset flow observed inside global value chains, it must be decided whether or not a change of economic ownership takes place.

4. This paper deals with an arrangement that attracted quite some attention from the TFGP as well as several other statistical bodies such as the Advisory Expert Group on National Accounts, UN Expert Group on international statistical classifications and Balance of Payments Committee, which is the so-called factoryless goods producers (FGPs), factoryless manufacturers, virtual manufacturers, or fabless manufacturers. 'Goods sent abroad for processing' and 'goods under merchanting' are examples of global production arrangements for which the recording conventions are well established in the 2008 SNA and the BPM6. Despite some similarities with both of these arrangements, the Guide considers factoryless goods production as a separate arrangement, for which the accounting standards at present provide insufficient guidance. The tentative recommendations in the Guide should serve as the starting point of strengthening the representation of factoryless goods production in future versions of the international and national accounting standards.

5. Based on evidence the Task Force was able to collect, factoryless production arrangements in various forms are becoming more widespread. Given the lack of clarity about their accounting treatment and problems with identifying FGPs, this situation may hamper the coherence of macroeconomic statistics and their international comparability. As in many countries the treatment of

these kinds of complex global production arrangements expectedly require a lot of effort, the main purpose of the Guide is providing guidance in terms of accounting concepts, statistical observation and measurement.

6. The next section introduces the main characteristics of factoryless goods production arrangements (in short factoryless arrangements). Section 3 summarizes the accounting treatment of FGPs in line with current guidelines. Section 4 elaborates on a number of country case studies dealing with factoryless arrangements. Section 5 presents the TFGP's recommended alternative view on the treatment of FGPs. Section 6 discusses ways to identify FGPs and dealing with borderline cases in practice. The last section winds up with a number of unresolved issues for future research.

2. Introduction to factoryless goods production

7. A FGP acts in a global production arrangement as the principal that controls the outcome of production of a good by undertaking the entrepreneurial steps and supplying inputs of intellectual property products (IPPs) required for producing the good. FGPs concentrate on innovation and marketing decisions. They supply substantial service inputs in the form of technology, know-how, and product design. Likewise, FGPs maintain control over the outcome of the production process by providing technical specifications that are essential for the transformation of the material inputs. FGPs usually control access and delivery of the final output to consumers. While a principal that is factoryless in nature (i.e., does not maintain a manufacturing plant) may or may not purchase and supply the raw materials or semi-manufactured goods subject to physical transformation carried out by the contract processor, in this paper FGPs are defined as not purchasing and supplying any material inputs into the production process. This will be discussed in more detail below.

8. On the other hand, the contract processor in the arrangement manages the transformation process by (a) purchasing and supplying the material inputs and (b) transforming the material inputs into final goods. The contract processor is a manufacturer that delivers pre-specified goods to the FGP at pre-determined prices and cannot sell the goods to parties other than the specific FGP which acts as the principal. While a transaction in goods takes place between the contract processor and FGP, the transaction cannot be seen as an unconditional or arm's length market transaction. A key feature in this arrangement is the conditional transaction where the contract processor is a captive: it cannot sell the good to other parties. In case of factoryless goods production, control over the outcome of the production process and the ownership and provision of IPP inputs seem to coincide with the economic ownership of the final output.

9. The International Standard Industrial Classification of All Economic Activities (ISIC) Revision 4 provides guidelines for classifying a unit that outsources production. Paragraph 137 of ISIC defines the term "outsourcing" as "…a contractual agreement according to which the principal requires the contractor to carry out a specific production process." In ISIC, criteria for classifying a principal that outsources the complete production process are as follows:

> *Outsourcing of the complete production process*
>
> *142. In general, if the principal outsources the complete production process of a good or service, it is classified as if it were carrying out the production process itself. This applies in*

particular to all service-producing activities, including construction. In the case of manufacturing, however, the following special considerations apply.

143. In manufacturing, the principal provides the contractor with the technical specifications of the manufacturing activity to be carried out on the input materials. The input materials (raw materials or intermediate goods) can either be provided (owned) by the principal or not.

144. A principal who completely outsources the transformation process should be classified into manufacturing if and only if it owns the input materials to the production process—and therefore owns the final output.

145. A principal who completely outsources the transformation process but does not own the input materials is in fact buying the completed good from the contractor with the intention to re-sell it. Such an activity is classified in Section G (wholesale and retail trade), specifically according to the type of sale and the specific type of good sold.

10. Paragraphs 142-145 of ISIC Rev.4 indicate that factoryless producers should be classified as distributors or resellers if they do not own the material inputs. This implies that companies that do not maintain a manufacturing plant could still be classified in the manufacturing sector (and thus be 'factoryless') as long as they purchased some of the material inputs and provided them to the contractor. So, a seemingly insignificant difference in the global production arrangement, i.e. the upfront ownership of at least some of the material inputs prior to processing radically changes the representation of a principal in terms of ISIC: manufacturing versus trade. In the case where the principal obtains ownership of (some of) the materials prior to physical transformation, the production arrangement corresponds to the 'goods sent abroad for processing' arrangement. This is where FGPs differ and why this paper presents a 'narrow' view of what it means by 'factoryless' production.

11. At present, the representation of FGPs in the global production typology of the Guide is in line with the ISIC Rev.4 recommendations. The following section introduces this currently recommended treatment of FGPs. However, the delivery of key IPP related inputs into the production process implies that the role of FGPs in such an arrangement is more substantive than trading. Therefore, the Guide recommends that more strict rules for detection of these companies are developed, so they can be separately identified and analysed within trade classes. As a next step the alternative view on the treatment of FGPs, outlined in Section 5 of this paper, requires further testing in order to enhance the guidance on these companies in the international accounting standards.

3. Accounting treatment of factoryless goods production according to current guidelines

12. The Guide uses the fictitious athletic shoe numerical example presented in table 1 to illustrate the accounting features of various global production arrangements, including factoryless goods production. The characteristics of individual global production arrangements vary according to the division of tasks (or business functions) inside these arrangements. In this section the example is used to illustrate how FGPs should be recorded in line with ISIC Rev.4.

Table 1
Breakdown of value of the athletic shoe

Value components	
Material inputs	30
Compensation of production workers	20
Compensation of managers for managing production	2
Other purchased services associated with production of the shoe	3
Return on intellectual property products (IPP)	30
Compensation of sales workers	15
Purchased services associated with selling the shoe	4
Profit on selling the shoe	6
Total	110

3.1 The plain factoryless goods production case

13. Consider a principal in Country A, engaged in making athletic shoes, who specialises its activities on creating new innovative designs that cushions the foot and provides for better athletic performance. The principal outsources the material transformation stage of its athletic shoes production process to a foreign supplier located in Country B. The principal controls the production of the shoe by providing the supplier the blueprints of production. The principal maintains ownership of the intellectual property embedded in the shoe, controls the overall production process and is responsible for marketing and selling the shoe. The supplier purchases the materials (according to the specifications of the principal) and after transformation the principal acquires the shoe at the factory gate price *including* the material costs plus a processing fee (compensation of the production workers) but *excluding* any value associated with the use of IPPs in this production process.

14. Following ISIC Rev.4 recommendations, the production accounts of the principal and supplier show similarities with a 'goods under merchanting' arrangement (i.e. purchasing and reselling a good from a foreign supplier to a foreign customer without the good crossing domestic borders). However, there is one significant difference. In case of merchanting, the IPP related inputs (30) are provided by the supplier of the good, while in the case of factoryless goods production the IPP related inputs are provided by the principal. In addition, in this case the management of manufacturing (2) is supposed to be carried out by the principal as well, and not by the supplier. Further, the other services associated with production of the shoe (3) are equally supposed to be purchased by FGP, and not by the supplier.

15. As a consequence the output of FGPs, i.e. the trade margin, equals 60 instead of 25 that would be recorded in the case of merchanting. Current standards recommend that the total output of FGPs is recorded as trade margin. It should be stressed that IPP related activities (30) are larger than the conventional trade margin as shown under merchanting (25).

16. Alternatively, one might argue that the principal should not be classified to the distribution sector and that the IPP input should be accounted for as an intrinsic part of the commodity value at basic prices. This point is further discussed in Section 5.

17. Since, according to the current standards, the principal of an FGP arrangement is identified as a distributor, the recording of international transactions is almost similar to those recorded under a merchanting arrangement if the good is sold abroad and never enters the territory of the principal. But again, one significant difference is that in the case of factoryless goods production the IPP inputs are not reflected in Country B's export of goods. Instead, the IPP inputs show up in the net exports of goods under merchanting of Country A, i.e. as part of the trade margin.

Table 2
Production account, countries A and B

	Principal Country A Trade	*Supplier Country B Manufacturing*
Gross Output	**60**	**50**
Goods	0	50
Services	60	0
Intermediate inputs	**7**	**30**
Materials	0	30
Processing services	0	0
Other services	7	0
Value added	**53**	**20**
Compensation of employees	17	20
Taxes less subsidies on production	0	0
Gross operating surplus	36	0

Table 3
International transactions

	Country A	*Country B*	*Country C*	*Total*
Exports	**60**	**50**	**0**	**110**
Goods	60	50	0	110
Net exports of goods under merchanting	60	0	0	60
Goods acquired under merchanting	-50	0	0	-50
Goods sold under merchanting	110	0	0	110
Services	0	0	0	0
Imports	**0**	**0**	**110**	**110**
Goods	0	0	110	110
Services	0	0	0	0

18. It should be emphasised that the arrangements discussed in the numerical examples are simplified versions of actual FGP arrangements that can be very elaborate. The discussion above illustrates that a firm might use a combination of global production arrangements and statistical offices may have difficulty distinguishing between a producer that is only branding products and a producer that provides the blueprints of the production process, thus exercising control over the production process.

3.2 Intellectual property supply by entities other than FGPs

19. The following example draws the borderline between a FGP and an IPP services supplier. The intellectual property inputs in global production arrangements may also be provided by entities other

than FGPs. For example, companies specialised in R&D may supply their knowledge inputs without being engaged in the production of goods.

20. Suppose an entity creates a new and innovative midsole that improves the athletic performance of runners. The entity sells the rights to use the design and the specifications for making the shoe to a shoe manufacturer which is also responsible for marketing and selling the shoe and receives the revenue. The R&D supplier receives revenue from selling or licensing the design and should not be seen as the principal arranging an international supply chain to make a particular good or service. It is simply a participant in the supply chain that is responsible for supplying the intellectual property products.

21. Continuing with the athletic shoe example, a unit in Country A is transferring the rights to use the design and blueprints of how to make the shoe to a manufacturer in Country B in return for a fee. The manufacturer in Country B transforms the shoe and is responsible for marketing and selling the shoe and records the full value of the shoe in its turnover, including the IPP service fee embedded in the shoe. Tables 4 and 5 show that the company in Country A exports the IPP service fee to Country B. All other production takes place in Country B under the full responsibility and ownership of the shoe manufacturer.

22. Other borderline cases are discussed in Section 6 of this paper.

Table 4
Production account, countries A and B

	Country A R&D provider	*Country B Manufacturer*
Gross Output	**30**	**110**
Goods	0	110
Services	30	0
Intermediate inputs	**0**	**67**
Materials	0	30
Processing services	0	0
Other services	0	37
Value added	**30**	**43**
Compensation of employees	0	37
Taxes less subsidies on production and imports	0	
Gross operating surplus	30	6

Table 5
International transactions

	Country A	*Country B*	*Country C*	*Total*
Exports	**30**	**110**	**0**	**140**
Goods	0	110	0	110
Services (use of intellectual property)	30	0	0	30
Imports	**0**	**30**	**110**	**140**
Goods	0	0	110	110
Services (use of intellectual property)	0	30	0	30

4. A short review of country case studies

23. The TFGP examined the validity of concepts and feasibility of measurement methods on the basis of country case studies. Some of them dealt with cases of FGP. Even though the collection of real life examples was not abundant, they show clear evidence that factoryless goods production exists and complicates statistical production.

24. Based on the information collected, various practices are encountered in identifying and accounting for FGPs in the various countries. Confusion about the precise nature of FGPs has led to an unsatisfactory situation in which these companies are classified in a variety of industries e.g. manufacturing, information technology, research and development (R&D) or wholesale trade, and their output may be recorded in different ways. It is important for international comparability to continue collecting more information in achieving internationally unified treatment practices.

4.1 Semiconductor enterprises

25. FGPs have been encountered in the domain of semiconductor manufacturing. These FGPs carry management tasks and contain large R&D units which are responsible for design, supply chain management and marketing of finalized products. The testing of semiconductors may be performed by affiliated subcontractors abroad. The semiconductors are manufactured by non-affiliated enterprises in a country with relatively low cost of labour. As such FGPs benefit from low production costs while concentrating their R&D resources on the end market. The share of the FGP in the added value chain is usually quite high and will mainly include R&D investment and returns on these investments. In their financial reports the domestic factoryless enterprises usually report the full value of sales from final output as domestic turnover.

4.2 Research-based producers outsourcing high-tech goods production

26. Another example in the Guide shows how producers of high-tech goods have been outsourcing the stages of physical transformation. This arrangement appears to be cost-effective due to streamlining of production processes and reductions in costs for freight. Production is often moved to the close neighbourhood of product markets while activities such as product chain management, R&D, software development, product design and product testing is kept in the country where FGP is resident. Also, turnover from sales worldwide is redistributed to the head offices on a merchanting basis, which is needed for funding the company's main activities such as R&D and design. These two activities are considered the comparative advantage of these FGPs.

27. In this case the product development is dominating R&D together with activities such as marketing, branding and other forms of IPP creation. An important part of the R&D process is obtaining new knowledge and innovations through mergers and acquisitions. All these examples of IPP creation and acquisition must be seen as an inseparable part of the final product, even though physical transformation of the "hardware" is fully outsourced. At first sight it seems these enterprises are transforming their business toward the production of services as their main activities are R&D, software development, design, trading etc. However, all these activities have one purpose only, namely to strengthen the company's final product in terms of competitiveness. Software and product designs are often developed and tested in the country of the FGP. They are then sold to the product supplier (contractor) under a license agreement to secure the content. The supplier provides the principal (FGP) with a manufacturing service.

4.3 Manufacturer of furniture

28. A former manufacturer of furniture transferred its production to various contract manufacturers all over the world. The company remained responsible for product design, testing, marketing and sale. The different parts of the product, delivered by the suppliers (contractors), are sent to logistics centres. These logistic centres assemble the product and send the completed product to customers. The leading company completely controls all product deliveries. Sales and related profits worldwide are reported in its business accounts. As recommended by ISIC Rev. 4 the statistical office dealing with this FGP classifies this company in its business register within retail and wholesale trade. However, determining the industry classification of a factoryless producer is not straightforward. A special feature in this case is that the raw materials as processed by the suppliers are not owned by the leading company, while the produced parts as delivered to the logistics centres are. The activities of the logistics centres could be regarded as industrial processing, which would make the leading company a manufacturer. In any case, the intellectual property embedded in the products resembles a vital part of the production chain. Trading represents only a limited part of the economic activities carried out by this FGP.

4.4 A FGP carrying out a wider range of activities

29. A FGP could also be involved in a combination of activities such as the factoryless goods production of a product A and branding of a product B. One such firm, a computer producer, utilizes a significant number of unaffiliated contractors around the world to manufacture products that have been designed by the firm. The firm uses multiple contractors to maintain flexibility in their supply chain and manufacturing process thereby generating cost-efficiencies and reducing time to market for own-designed products. In addition, the computer firm's financial statements indicate that the firm also purchases original manufactured products from third-party producers and resells these products under the firm's own-brand name. The issue of branding is discussed later on in this paper.

5. Proposed alternative accounting methods for FGPs

30. There is an emerging consensus among national accountants and balance of payments compilers that the current treatment of FGPs as outlined in Tables 2 and 3 is not satisfactory, and alternative options should be considered. It is argued that the provision of critical inputs such as IPP services (i.e. the blueprints of products) implies that FGPs are engaged in activities other than trade. This suggests that the criterion of ownership of material inputs in ISIC Rev.4 should be broadened to include critical services inputs such as those related to IPPs. Others have argued that FGPs are neither distributors nor manufactures but a totally new category of producers which at present are not separately identified in the current industry classifications.

31. This section provides an alternative view on the treatment of FGPs in which they are seen as producers of goods instead of traders in goods. FGPs do more than simply buy and sell. Under a factoryless arrangement, the principal (FGP) controls the blueprints of production, access to customers, trademarks, and other sources of significant value embodied in the final output. The contractor only manages the material transformation related activities by strictly following the product specifications provided by the principal.

32. A key characteristic of the contractual arrangement is the captive nature of the contractor. Processing activities cannot be undertaken without the blueprints provided by the principal. Once processing is finalised according to the conditions of the contract, the contractor is entitled to compensation from the principal, and the output is no longer under the contractor's control. The contractor is not allowed to sell the output to other parties but must sell to the principal. As a result, the value added of the FGP may be significantly more than the margin associated with the activities of merely distributing goods from a producer to a consumer since the IPP inputs embedded in the good may contribute significant value to the good measured in basic prices.

33. While identified as manufacturers, the production functions or cost structures of FGPs will differ substantially from those of 'classic' vertically integrated manufacturers. From this viewpoint there may be a need to 'flag' FGPs to allow separate analyses for example in relation to input-output analysis and measuring trade in value added.

5.1 Factoryless goods production among other global production arrangements

34. The following guidance could assist statistics compilers in separating FGPs from the principals active in merchanting or goods sent for processing arrangements.

Factoryless goods production versus merchanting

35. When examining the differences between trading (merchanting) and factoryless goods production the significance of IPP use in the production process of the principal firm plays a decisive role. Yet, concrete decision rules are needed as FGPs will often be active in several areas such as product development, supply chain management, marketing and trade. The role of the principal in a global production arrangement must be assessed by looking at the dominance of IPP inputs and typical activities such as innovation, supply chain management and marketing versus the provision of purely distribution services. This should determine the firm's overall economic engagement: factoryless goods production or trading (merchanting).

36. This leaves open the role of branding in a factoryless arrangement. A principal may not supply the blueprints for production but instead purchases goods from manufacturers and resells the goods under its brand name. These companies may spend large amounts of money on marketing assets (advertising) to elevate the attractiveness of the brand it sells. And the return on these 'investments' will show up as a substantial increase in the value of the good as sold to customers. It has been argued that in the eyes of customers the quality of the product has increased substantially due to branding. This suggests that between purchasing and selling, the good is being transformed in terms of its quality, although perhaps not in a physical sense.

37. Branding is often associated with arrangements that are led by firms involved in the downstream end of the global supply chain, such as retailers. In terms of 'physical transformation', one may argue that branding does not significantly differ from retailing. One could make the same argument for IPPs and trading, but the key difference here is that two products with the same material characteristics but different IPP inputs will have demonstrably different performance (and tangible quality) but two products identical in every way except for the brand name will not (all other things being equal). As a result, and in line with the current standards (and also with the fact that unlike IPPs, 'brands' are not considered produced assets), it is recommended that companies concentrating

their activities on branding inside the global value chain, without offering significant IPP input, should be identified as distributors and also not be identified as FGPs.

38. The research agenda of the 2008 SNA includes the recording of marketing assets (A4.53) as one issue to be investigated. According to the 2008 SNA marketing assets include brand names, mastheads, trademarks, logos and domain names. Marketing is a key driver of brand value and big corporations invest heavily in building and supporting their brands by advertising, sponsorship and other measures to build a positive image with customers. The 2008 SNA treats marketing assets as being non-produced and the expenditures incurred in their creation as intermediate consumption. They appear in the balance sheet only when they are sold. The major reason for not treating marketing assets as fixed assets is the difficulty of measuring their value.

39. More generally, the 2008 SNA research agenda acknowledges that product innovation and product development involves, in addition to R&D, other activities such as product design, market research and marketing. FGPs are expected to play a significant role in each of these areas. Supply chain management is another characteristic activity of FGPs. With the exception of R&D, each of these activities does not lead to IPP capital formation and IPP use in the strict 2008 SNA sense.

40. Acknowledging that factoryless goods production involves this broader range of activities, it is suggested that FGPs are defined as those companies which are substantive IPP investors and more than 50% of value added originates from returns not only on IPP activities such as R&D but also on design, innovation, supply chain management, including activities related to non-produced assets, such as market research and marketing. Because a company must be a substantive IPP investor most companies that are only involved in branding should be excluded under these criteria. It is important to stress that this definition may require refinement in the near future, based on country experiences with implementing the Guide into practice.

41. In the Guide the following example draws a borderline between FGP and branding. A principal provides a blueprint (the product design) of a toy car to a contract manufacturer abroad for production. However, the toy design does not relate to IPP investment. Like FGPs the principal maintains control over the outcome of the production process and takes responsibilities for maintaining access to consumer markets and delivery of the final output to consumers. The contractor manages the transformation process by supplying all material inputs according to the specifications of the principal and transforming them to final products according to the blueprint provided by the principal. The contractor delivers pre-specified goods to the principal at pre-determined prices. As there is no IPP input involved and the design inputs embedded in the toy car do not contribute significant value to it, the principal cannot be identified as FGP. Instead the principal is deemed to be engaged in trading.

Factoryless goods production versus goods sent for processing

42. Transformation of goods owned by others (processing) is well described in the 2008 SNA and BPM6. The classic example of a processing arrangement is that of the principal shipping raw materials or semi-fabricated goods to a processor abroad.

43. An arrangement that presents a challenge is when the principal outsources completely the production process (similarly to FGPs) but also acquired (some of the) material inputs prior to transformation. These inputs may be purchased abroad and subsequently shipped to the processor. As

the principal obtains economic ownership of (some of the) material inputs, this would be recorded as a case of processing. It should be acknowledged that the principal in such a processing arrangement has become 'factoryless' similar to principals outsourcing all purchases of the material inputs. Such companies should also be taken into consideration when defining the scope of factoryless goods producers in a future revision of ISIC.

44. A pragmatic choice is needed to distinguish those 'factoryless' arrangements falling under processing from those falling under factoryless production (in a narrow sense i.e. FGP supplies IPP inputs but no material inputs). The dividing line that could be drawn according to the current accounting standards is whether or not the principal has obtained at least part of the material inputs prior to processing. This criterion is in accordance with how goods sent for processing is currently explained in 2008 SNA and BPM6, and in line with the ISIC criteria for outsourcing. For example, BPM6 explicitly mentions that processing fees may partly reflect the costs of supplementary (material) inputs purchased by the processor.

45. The principals active in a 'factoryless' arrangement that fall under processing or a factoryless goods production (in the narrow sense) are often responsible for similar kinds of tasks inside the global value chain. A broad notion of FGPs is sometimes used to identify the principals of global production arrangements that are responsible for the IPP inputs, design, value chain management, marketing etc., irrespective of whether or not some of the material inputs are purchased by this principal prior to processing by a contract manufacturer.

FGPs versus head offices

46. According to ISIC, head offices (ISIC Rev.4 - 7010) include those units overseeing and managing other units of the company or enterprise, undertaking the strategic or organizational planning and decision making for the company or enterprise by exercising operational control and managing the day-to-day operations of their related units. The output of head offices often represents intra-company services.

47. FGPs play a more active role in the production process. FGPs may be subject to supervision of a head office. As argued, FGPs are directly responsible for the IPP related inputs usually obtained from in-house research or software development. They are also responsible for value chain management usually including all stages of production: from design, material transformation up to managing consumer markets. In a factoryless arrangement, the foreign contractor may, or may not, be part of the multinational enterprise structure.

5.2 Output of factoryless goods producers and contractors

FGPs

48. At first sight FGPs seem to be engaged in a similar sequence of international goods transactions as merchants. However, FGP's activities differ from trading due to the significant contribution made by IPPs owned by the principal which can be considered transformative. The scale of value added generated by FGPs as returns to IPPs, management and other services provided clearly exceeds the amount generated from core distribution activities such as minimal processing, grading, cleaning and packaging as referred to in the 2008 SNA. If FGPs are recognised as a special category of manufacturers, their output should accordingly reflect the full value of the manufactured good as sold

to (foreign) customers, and not a trade margin. Similarly, the supply of goods by the contractor should be recorded as part of the FGP's intermediate consumption.

Contract manufacturers under a factoryless arrangement

49. The well-established accounting rules of goods sent for processing explain that the contractor's output is recorded as a manufacturing service. For the contracting firm this treatment also follows in the case where some part of material inputs are purchased on own account. Under such conditions the manufacturing service will include the value of these material inputs.

50. Whilst it is clear that FGPs are in the business of producing goods, the output produced by the contractor under a factoryless arrangement requires some further elaboration. Under a processing arrangement the contractor transforms material inputs provided by the principal into a final product. Under a factoryless arrangement the contractor buys and transforms material inputs into a final output on the basis of the product specifications, i.e. the IPP related inputs, provided by the principal. In other words, a central feature of a factoryless arrangement is that the 'intangible' components owned by the FGP are physically embodied in the contractor's output, even though they are not included in the price as settled between the contractor and the principal.

51. Under a processing arrangement the contractor is not at liberty to sell its output to any purchaser. Such a restriction also holds under a factoryless arrangement. The transaction between the contractor and the FGP is based on an off market price for a product that in reality has a greater value, including the IPP capital service. However, under a factoryless arrangement the contractor is responsible for acquiring the material inputs in accordance with the specifications of the required output as defined by the FGP. Under such conditions the contractor takes more risks and plays a more active role in the production process compared to a contractor under a purely processing arrangement. Under a factoryless arrangement the contractor is generally exposed to risks related to fluctuating material input prices and holding inventories.

52. So, the key question is whether or not the contractor under a factoryless arrangement provides a manufacturing service, similar to a contractor's output under a processing arrangement. This question is tightly linked to the issue of economic ownership of the good being produced. Under processing, the principal owns substantial parts of the material inputs used in production. This implies the principal is also expected to own the final product. As a logical consequence the contractor is providing a manufacturing service.

53. Under a factoryless arrangement, the material inputs are directly acquired by the contractor, who is expected to be in control of any material inputs held in inventory prior to transformation. In contrast, the IPP inputs are under control of the principal. This split in ownership of material and intangible inputs makes it difficult to determine the economic ownership of the contractor's output prior to the delivery and whether the contractor is de-facto producing a good or a service. There are two options to consider:

a. Under a factoryless arrangement the contractor is, during the transformation process and prior to the transaction, considered the economic owner of the good it produces. The contractor will be selling the good and, at the point of sale, the economic ownership is then handed over to the FGP;

b. Alternatively, the principal is identified as the economic owner of the good during the transformation process and prior to its delivery. This implies the contractor provides manufacturing services on goods owned by the FGP. The transaction taking place between the contractor and the FGP is that of a processing fee.

54. It should be emphasized that this choice does not affect the contractor's output value. Whether recording a good (a.) or a processing service (b.), the output of the contractor will cover the value of labour inputs, capital inputs and purchased materials, but exclude in any case the value of the IPP related inputs supplied by the FGP.

55. Regarding an assessment of control, risk and rewards, as recommended by the SNA, it seems unlikely that any data will ever be available to make an informed decision on ownership of the contractor's output on a case-by-case basis. This means a workable convention is needed which could be established on the basis of the following arguments.

56. The arguments that can be brought forward in favour of option (a) are:

i. Besides factoryless arrangements, there are other examples where a producer and customer agree on the characteristics and the price of the (custom made) good prior to its production and delivery. These conditions may be such that the good cannot be sold to other customers. Generally, under such circumstances, the supplier will still be identified as the producer of the good and a transfer of ownership takes place at the moment the good is transacted. Also, before a transaction takes place, the contractor is expected to bear the risk of holding these manufactured goods in inventory, for example with respect to theft or accidents. This indicates the supplier is the economic owner of the manufactured goods prior to being transacted.

ii. When recording a manufacturing service, the production accounts of the contractor and the FGP will both be blurred by the fact that the contractor produces industrial services combined with substantive use of material inputs (which seems odd) while the FGP produces a good without consuming any material inputs (idem). As such a processing type of arrangement does not seem to match very well with the fact that the principal is not responsible for acquiring any of the material inputs of production. Therefore, processing and factoryless goods production should be seen as different global production arrangements.

iii. Although the physical characteristics of the good do not change between purchase and sale, the FGP will increase its value substantially by adding a return on IPPs. As such, one may conclude that in an economic sense the good purchased from the contractor is not at all the same good sold to final customers.

iv. In contrast to processing, the contractor under a factoryless arrangement, is expected to be more active on input markets and will as such face risks with respect to material input prices and holding inventories. These risks should under such conditions translate to higher profit margins for the contractor.

57. Alternatively, arguments supporting option b are:

i. The contractor never becomes the economic owner of the good being produced under a factoryless arrangement, because the contractor does not have the decision power to freely sell its output or to set its prices. The contractor assembles a good by strictly following the

blueprints provided by the principal. The transaction between the contractor and the FGP is based on an off market price for a product that in reality has a greater value on account of the IPP services included in it, irrespective of the risk management involved on the contractor's part. In economic terms, the contractor's output could more accurately be described as a manufacturing service encompassing material inputs. BPM6 (10.64) explains that manufacturing services may include the value of material inputs purchased by the contractor, even though this paragraph does not specifically address those cases where all material inputs are purchased by the contractor;

ii. As such FGPs fall nicely under the goods sent for processing arrangement which simplifies the overall picture of goods related global production arrangements, limiting them only to merchanting and processing cases.

iii. A good cannot be produced twice. The physical characteristics of the good are not altered by the FGP. This implies the transaction between the contractor and FGP resembles a manufacturing service.

58. Although there was no full agreement, the majority of the TFGP supported the recording of a transaction in goods (option a) between the supplier and principal under a factoryless arrangement. This recording follows the logic that, in economic terms, the good purchased by the FGP is an intermediate product to which the IPP value is subsequently added before being sold to the final customer.

Two recording options to consider

59. If the conclusion is that FGPs are engaged in manufacturing a transaction in goods is recorded between the contractor and the principal. A subsequent question then arises concerning the type of recording to be followed in the international accounts. In this context it is assumed that the contractor, the principal and the final customer are supposed to be resident in different countries. There are two options:

a. Gross recording of the import and export flows of goods (general merchandise);

b. Net recording, i.e. net export of goods under merchanting, taking the country's perspective in which the FGP is resident.

60. Proposition b is advocated in relation to par.10.42 of BPM6:

"In cases where the merchant is the organizer of a global manufacturing process, the selling price may also cover elements such as providing planning, management, patents and other know-how, marketing, and financing. Particularly for high-technology goods, these nonphysical contributions may be large in relation to the value of materials and assembly."

61. Contrary to arrangements such as 'transformation of goods owned by others' and 'merchanting' factoryless goods production is not explicitly addressed in BPM6. BPM6 provides no guidance on cases where the value from these additional IPP related services is much larger than the value related to distribution services. One may conclude that the guidance in par.10.42 does not address specific cases of factoryless goods production.

62. When considered as manufacturers, the output of FGPs as manufacturers should reflect the full value of goods as sold to (foreign) customers instead of a trade margin. Similarly, the purchase of goods obtained from the (foreign) contractor (at prices excluding the IPP component) should be recorded as intermediate consumption. This gross recording in the production account of the FGP should be matched by a gross recording of the respective flows of goods under general merchandise (option a).

Suggested recording of output and international transactions

63. Tables 6 and 7 summarize the alternative view of the TFGP, based on the athletic shoes example. The supplier's output of goods reflects the 'factory-gate' value of the shoe, excluding the IPP inputs. The principal's output reflects the product's full value including the IPP inputs. Table 7 illustrates the international trade in goods as recorded under general merchandise.

Table 6
Production account, countries A and B

	Principal Country A Manufacturing	*Suppliers Country B Manufacturing*
Gross Output	**110**	**50**
Goods	110	50
Services	0	0
Intermediate inputs	**57**	**30**
Materials	50	30
Processing services	0	0
Other services	7	0
Value added	**53**	**20**
Compensation of employees	17	20
Taxes less subsidies on production and imports	0	0
Gross operating surplus	36	0

Table 7
International transactions

	Country A	*Country B*	*Country C*	*Total*
Exports	**110**	**50**	**0**	**160**
Goods	110	50	0	160
Services	0	0	0	0
Imports	**50**	**0**	**110**	**160**
Goods	50	0	110	160
Services	0	0	0	0

5.3 Untangling the more complex global production arrangements

64. Factoryless arrangements are difficult to grasp in national accounts, even though the example of a factoryless arrangement presented above is still rather straightforward. Encountered real life cases can be more complex. For example, FGPs may locate their distribution activities in close connection to foreign consumer markets. Under such conditions the turnover may no longer be reported by the FGP but instead by their foreign affiliates responsible for wholesale and retail activities. This seriously complicates the identification of such FGPs as well as determining the accounting

conventions that handle more complex arrangements. These more complex arrangements are further elaborated below.

Factoryless goods production with a foreign distributor, manufacturing related turnover is reported in Country A

65. The next example, as illustrated in the tables 8 and 9, presents a case in which distribution activities are carried out, not by the principal but by a foreign affiliated company in the country in which the final products are sold to customers.

Table 8
Production accounts

	Country A ***Company Y*** *Principal*	***Country B*** ***Company X*** *Contract Manufacturer*	***Country C*** ***Company Y*** *Distributor*	***Company Y*** *Globally Consolidated Accounts*
Gross Output	**85**	**50**	**25**	**110**
Goods	85	50	0	85
Services	0	0	25	25
Intermediate inputs	**53**	**30**	**4**	**57**
Materials	50	30	0	50
Other services	3	0	4	7
Value added	**32**	**20**	**21**	**53**
Compensation of employees	2	20	15	17
Taxes less subsidies on production and imports	0	0	0	0
Gross operating surplus	30	0	6	36

Table 9
International transactions

	Country A	***Country B***	***Country C***
Exports	**85**	**50**	**0**
Goods	85	50	0
Services	0	0	0
Imports	**50**	**0**	**85**
Goods	50	0	85
Services	0	0	0

66. In the example, the principal is situated in Country A, the contract producer in Country B and the distributer in Country C where the goods are brought to the consumers. The principal and distributer belong to the same (multinational) enterprise (Company Y). The contract producer, on the other hand, represents an unaffiliated firm (Company X).

67. The principal reports the turnover (85) from the manufacturing related activities at producers' prices. This turnover includes the purchase of (intermediate) goods from the contract producer (50), a compensation for IPP inputs (30), production related services (3) and management costs (2).

68. The principal organises its wholesale and retail activities via a foreign affiliated company situated in the direct neighbourhood of the consumer market in Country C. The output of this foreign affiliate reflects a trade margin (25 = 110 - 85) which includes trade related service inputs (4), compensation of sales workers (15) and a pure profit margin (6).

69. Assuming similar tax arrangements in the Countries A and C, Company Y is indifferent about which country the turnover from wholesale and retail activities is being reported, as profits reported in Country C will be appropriated by the parent in Country A as returns on foreign investment.

70. The example shows that offshoring the distribution related elements of the value added chain to a foreign affiliated company does not alter the role of the principal as the FGP. The Guide mentions that FGPs often combine value chain management and IPP related activities (e.g. research, product development) with trade related activities. But its characteristic activities are product development (e.g. providing the IPP inputs) and value chain management, and not trade.

71. Despite the several measurement challenges underscored in the Guide in connection to FGPs, the divergences of this arrangement compared with the 'classical' factoryless goods production case, do not increasingly complicate the measurement and compilation issues for such FGPs. It could be argued whether or not the profit margin (6) should be entirely associated with the distribution activities in Country C, but this is a rather minor issue. A crucial condition is that the entire manufacturing related output (as opposed to distribution related output) remains in the accounts of the FGP. This condition may not always hold.

Factoryless production with a foreign distributor, manufacturing related turnover is no longer reported in Country A

72. The statistical observation of a factoryless arrangement becomes critically complicated once the turnover is no longer reported at the level of the principal (in the previous example still identified as the FGP) in Country A. This situation may occur when, driven by tax planning, turnover is only reported at the level of the foreign affiliated distributor in Country C. Taking advantage of favourable tax arrangements the principal may prefer reporting the turnover and profits in Country C instead of Country A.

73. As the information on the existence of such arrangements was brought to the attention of the TFGP at a late stage of finalization of the Guide, practical examples could not be collected and analysed in depth. This issue should be reviewed with priority in the future work on typology of global production arrangements and FGPs.

Goods sent abroad for processing combined with a foreign distributor

74. Foreign affiliated distributors can also exist in combination with principals managing a goods sent abroad for processing arrangement. Under such conditions the principal is beyond doubt the economic owner of the processed goods prior to shipment of the goods to the distributor. It pays a processing fee and will be reporting the output of the processed goods in its production account. This implies a transaction in goods at producers' prices must take place between the principal and the foreign affiliated distributor or the distributor could be paid a commission for sales/distribution services provided to the principal who retains ownership of the goods themselves. In other words, the problems encountered above are not expected in relation to processing type of arrangements.

6. Identifying factoryless goods producers and borderline cases in practice

75. Under current guidelines FGP are considered as a special case of merchants. However, due to their specific characteristics and the more active role they take in the manufacturing stages of

production it is recommended that FGPs are separately identified within trade classes. This separate identification will allow further analysis of the characteristics of FGPs and will inform future revision of international standards to include FGPs in respective manufacturing classes.

76. If FGPs are classified in trade their recording will follow the merchanting arrangements and the following data items are needed:

a. Estimate of the trade service of the merchant;

b. Estimate of the imports (or negative exports) and exports under merchanting;

c. Estimate of (changes in) inventories held abroad.

77. The necessary accounting adjustments when FGPs will be classified to manufacturing are presented in Section 5 above.

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

6.1 Identifying factoryless goods producers

79. The key challenge of factoryless producers is identifying the nature of their activities and to distinguish them from trading. It was highlighted earlier that different activities such as factoryless goods production and trading (including branding) may be combined. This may complicate the picture and the classification of companies engaged in this mixture of global production arrangements.

80. As already indicated, a first signal helping to identify a FGP is when seemingly traders appear to be huge investors in intangible capital and generating higher than average trade margins. These relatively high trade margins encapsulate the returns to intangible capital. A complicating factor is of course that such companies may not be included in the sample of R&D surveys, when these companies are classified as traders.

81. Manufacturers associations may be consulted to list known factoryless producers of goods, particularly when these companies are known to operate in specific industry branches, the most obvious being consumer electronics and semi-conductor industries. Secondly, FGPs will employ workers with above average wages per hour, so this information may serve as another indicator.

82. In a following step the financial reports of these enterprises could be examined to derive the proper estimates of their output. Additional detection methods include data comparisons and analysis involving various data sources, preferably on the basis of a single company identification number, such as:

a. Detailed banking data on transactions in foreign currency classified as exports of goods could be compared with customs data on exports for individual enterprises. Whenever banking data on exports of goods for an enterprise are significantly higher than customs data, it may be suspected that there is a case of factoryless production of goods (or merchanting), and the financial reports have to be further examined.

However, banking data may be subject to classification problems. Time lags in recording may play a disturbing role as well;

b. Yet another detection method is the comparison of VAT data on exports with customs data on exports for individual enterprises. Whenever for a particular enterprise VAT data on exports are significantly higher than customs data, it may be suspected that there is a case of global manufacturing (or merchanting) and further research is probably required.

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

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

6.2 Distinguishing factoryless goods producers from borderline cases

85. For borderline cases, differentiating FGPs from traders requires decomposition of the 'net output', i.e. all cost elements excluding the purchase of the manufactured good, in an IPP related, and a trade related, component. This may not be straightforward. But even when the company under consideration is beyond doubt identified as a factoryless goods producer, the trade service component still has to be identified and measured for computing its output at basic prices.

86. The most important step in this decomposition is calculating the capital service of the relevant IPPs on the balance sheet of the company under examination. The size of these capital services may give a reasonable indication of whether or not the company is indeed to be classified as factoryless goods producer. The residual income element may be allocated as trade margin.

87. The concept of capital services is introduced in Chapter 20 of the 2008 SNA. The capital service represents the service flow of an asset to production. Conceptually a capital service should correspond to a capital rental value. Without the possibility of observing such capital related transactions, the capital service value can be derived from so-called age-efficiency and age-price profiles as used in perpetual inventory methods to calculate capital stock values and consumption of fixed capital. Ideally, perpetual inventory methods are developed in such a way that they provide fully consistent information on stock values, consumption of fixed capital and capital services. For a deeper understanding of the subject, reference is made to the OECD manual on Measuring Capital.

88. A supplementary step may be analysing the quality aspects of labour input. Dedicated R&D or information and communication technology (ICT) surveys may show that substantial parts of the

labour input is actually involved in IPP development and related to IPP investment on own account. Substantive shares of highly educated labour will usually indicate that employees are engaged in managing production chains rather than in trading.

89. More generally, there are two important indicators that mark the presence of a FGP. Firstly, a trade margin that encapsulates the value of IPP related services will be substantially larger than that of a pure trader. Secondly, substantive ownership of IPPs, and R&D in particular, does not match very well with purely trade related activities, and this may indicate the presence of a factoryless goods producer.

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

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

92. Country examples on identifying factoryless goods production are still quite limited. The United States (U.S.) Census Bureau and Bureau of Economic Analysis (BEA) have been studying how to classify and collect data from entities that are part of global value chains. A key element is identifying the relationship between firms that outsource the fabrication of products, while still controlling the production process, and firms that perform the processing as contract manufacturing services. Through preliminary outreach conducted by the Census Bureau, respondents appear to understand the concept of contract manufacturing services and the need for U.S. statistical agencies to collect the data. Collecting data, however, could be challenging. Some respondents indicated that they were generally unable to provide data because either accounting or production management systems did not include a searchable characteristic that would distinguish these services. To determine whether data collection can be robust, the U.S. Census Bureau and BEA have added questions to their respective surveys ('Direct Investment Abroad' and 'Company Organization') to determine whether U.S. businesses can accurately report purchases and sales of contract manufacturing services. As a next step, the Census Bureau will evaluate the special inquiries on the 2012 Economic Census to see if information at the establishment level can better identify factoryless manufacturers and to assess whether sufficient data can be collected on the value of the manufacturing service and the associated revenue on sales of products produced by contract manufacturers.

7. Unresolved issues and future research

93. According to the current standards, FGPs show up as traders in economic statistics and their transactions are treated accordingly. The Guide suggests further reconsideration of the classification rules applied in ISIC in respect to FGPs. Ownership of material inputs should not be the sole determining factor in classifying FGPs as trader instead of manufacturer. The TFGP recommends that FGPs, who are controlling the outcome of the production process and providing (owns) the IPP inputs to a contractor, should be classified to manufacturing. As a first step it is recommended to develop rules for identification of FGPs in order to allow for better analysis of their characteristics. The

separate identification will facilitate the testing of the proposed accounting treatment in Section 5 of this paper.

94. The recommendations to classify FGPs as (a special case of) manufactures instead of traders is also beneficial from an input-output analysis perspective, as this will better reflect the global production chain in which these firms are operating, whereas as traders these leading firms would basically stay unlinked. In their role as manufacturers the IO tables are able to reflect their leading position inside the global production arrangement, for example as the producers and providers of the IPP related inputs, which increasingly explain the major part of the market value of manufactured goods. The case of FGPs shows that the input-output analysis of global production is partly about physical transformation but more and more related to the intangible aspects of production. This observation is in line with the OECD-WTO Trade in Value Added indicators identifying the direct and indirect significance of services in global production chains.

95. The Guide also explores the borderline between FGPs and distributors by providing further guidance on how to examine the significance of IPPs in the production activities of such firms. Priority area for further work is to collect more practical experience from countries that will allow further elaboration of the proposed criteria for classification of FGPs and recording of their transactions in national and balance of payments accounts.

96. Nowadays most high-tech products have product (the hardware) and service (software, R&D) components which are hard to disentangle. Similarly, the output of companies active in a global value chain may be goods or service related. The distinction between goods and services, and between goods and services providers may become more and more blurred. Nonetheless, under current statistical standards, it is apparent that the output of the contractor should usually be recorded in goods and not in services, if the contractor owns the material supplies and material inputs that it transforms into manufactured products. The goods-services distinction should be further examined in future revisions of SNA, BPM, ISIC and Central Product Classification.

97. A similar situation holds for the economic classification of producers. It was already mentioned that aggregating in one class the regular vertically integrated firms with those leading either a processing or a factoryless type of global production arrangement will inevitably lead to a heterogeneous representation of the production accounts, as presented by the supply-use tables, as the input structures of both categories of firms will differ fundamentally.

98. A similar situation applies to the contract producers under a processing or factoryless arrangement, which should preferably be presented in separate ISIC (sub) classes as well, as the output of these producers will differ from regular goods producers. For example, the contract producers under a processing arrangement will be providing processing services on goods owned by the principal. Under a factoryless arrangement, the contract producer will be manufacturing products on the basis of the technical specifications provided by the principal. Under such conditions the contract producers will not invest as heavily in intellectual property products as regular producers headed under the same ISIC category would need to do. Similarly, their output will not include any of the corresponding returns on intellectual property investment, as these will be acquired by the FGP when selling the goods to customers. For these reasons, and also because of their tight international

relationships, contract producers and processors should preferably be classified separately from the regular manufacturers in the corresponding ISIC class as well.

99. De Haan et al. (2014) refer in this context to the so-called business functions classification which is used in statistical surveys on international outsourcing to categorise the kind of activities transferred to affiliated or non-affiliated companies abroad (Statistics Denmark et al., 2008). In addition to the outsourcing of physical transformation, business functions which are frequently outsourced are e.g. transportation and warehousing activities, marketing and after sales services including help desks and call centres, ICT services, administrative and management functions and R&D. Each of these functions has corresponding classes in ISIC. But these codes do not necessarily indicate the characteristics of the global value chain to which these activities are linked. Particularly for head offices or R&D units, it would from an analytical point of view be useful to add information on the main characteristic of the global value chain to which these activities are linked, for example by indicating the main characteristics of the output generated in these chains.

100. A clear request from statistics compilers in previous consultations of the Guide is to establish a permanent forum where country experts could share information and experiences on measurement issues related to global production arrangements. Globalization will continue to lead to new global production related issues that have not been examined so far. Such a forum could support stocktaking of new cases, identifying best practices and further harmonization of accounting practices. First forum will be organized as a special meeting of the Group of Experts on National Accounts to discuss conceptual and measurement issues related to global production and will take place on 7-9 July in Geneva, Switzerland.

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