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Draft Chapter 1
Typology of Global Production Arrangements

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1. Globalization has created new opportunities and competitive challenges forcing producers to seek more efficient ways to make their products. It has become increasingly common for producers seeking more efficient means of production to divide the traditional vertically integrated production model into stages or tasks (known as fragments), which allows them to outsource part of their production process. When the resulting production arrangement is interlinked across different countries the measurement challenges facing national economic statistics programs increase dramatically.

2. Many economic forces are driving the fragmentation of production to specialized establishments both foreign and domestic. Improvements in information technology have allowed firms to relocate production to new and often distant locations. International cost differences— such as lower relative wage costs and lower trade and transport costs— improved logistics, and improved intellectual property rights protection and contract enforcement have facilitated the use of global supply chains and global value chains.[1]

3. This chapter focuses on developing a typology of global production arrangements. Section 1 clarifies the concepts of global supply chains, global value chains, and global production chains. Section 2 provides an overview of how enterprises organize their production arrangements. Section 3 discusses a simple typology of global production arrangements. Section 4 conclusions and next steps.

Section 1: Concepts of Global Supply Chain, Value Chain, and Production Chain

4. The terms global supply chain, global value chain, and global production chain are used when discussing globalization and the fragmenting of production across countries. Sometimes they are used interchangeably but they are not exactly the same concepts. This section discusses the concepts to enhance understanding of the various terms.

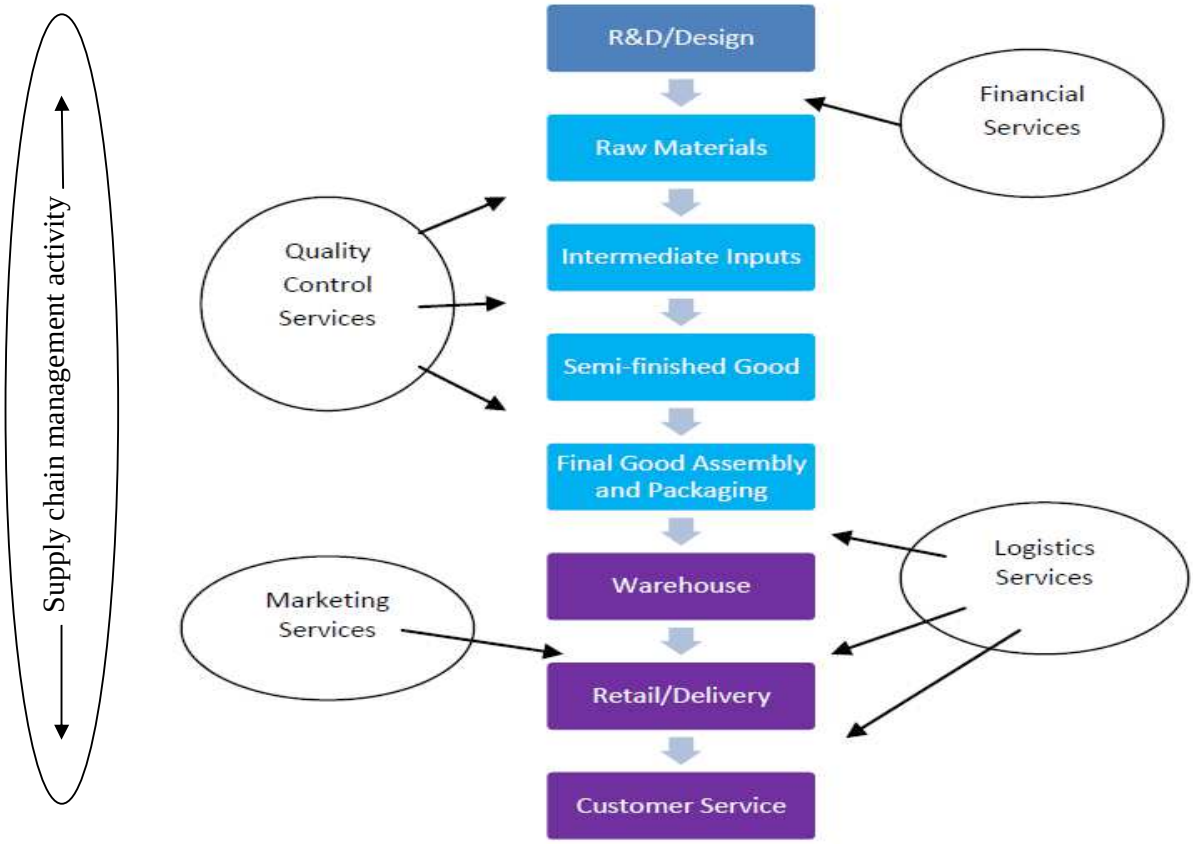
[1] U.S. International Trade Commission "Economic Effects of U.S. Import Restraints, Special Topic: Global Supply Chains," August 2011.

a. Global Supply Chain

5. The supply chain is a system of organization, technology, activities, information, and resources involved in moving a good or service from supplier to customer. A supply chain can be within an enterprise, between enterprises in a local economy, or among a group of countries. The supply chain is a network where the activities involved can be grouped using the traditional broad stages of production from upstream research and development (R&D) and design, through manufacturing, to downstream logistics, marketing, and sales. The complexity of the supply chain and the business relationship between the various stages can vary by industry and by enterprise. A global supply chain consists of a worldwide network of these activities.

6. Figure 1 provides a simple illustration of a supply chain. In the R&D and design stage an intangible asset is created that is later used as an input in making the good. The R&D and design can be used by the same enterprise to produce the good on its own account or can be provided to a supplier that produces the good. Although the figure only shows financial services being provided at the R&D/design stage in reality financial services can be provided at several stages in the supply chain. For example, leasing and consumer credits can be provided at the retail/delivery stage.

Figure 1: Illustration of a simple supply chain



Source: U.S. International Trade Commission compilation

b. Global Value Chain

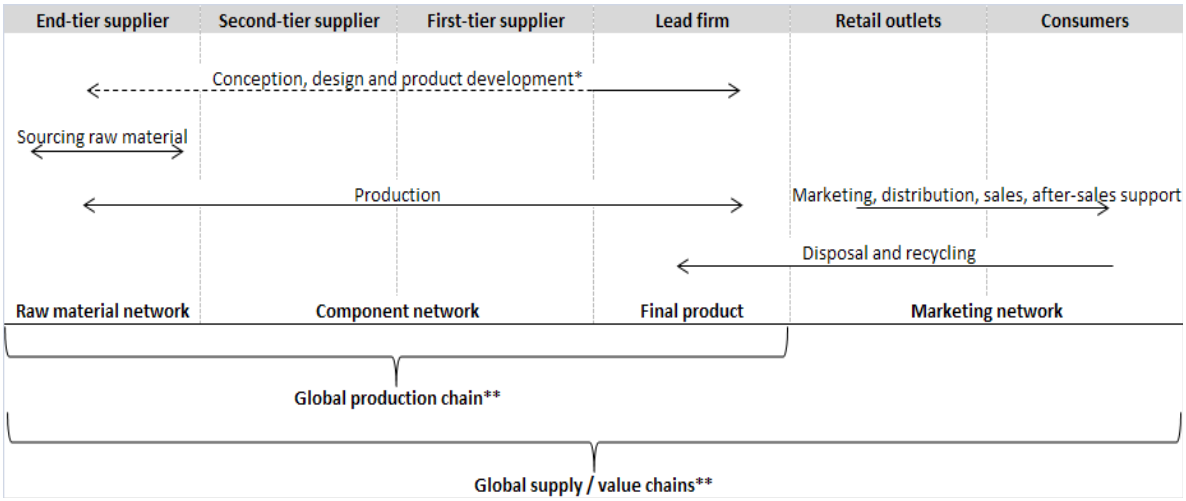
7. A value chain refers to the value added activities required to bring a good or service from its conception, design, production, marketing, distribution and support to final customers.[2] It is the value added to the good or service at each stage of the network. Similar to the supply chain, the complexity of the value chain and the business relationship between the various stages can vary by industry and by enterprise. A value chain can be between enterprises in a local economy or span enterprises across a group of countries.

c. Global Production Chain

8. A production chain refers to linkages within or among a group of enterprises in a particular value chain for producing specific goods or services. It represents how lead enterprises arrange their particular network of suppliers to produce a given good or service. The lead enterprise exerts a considerable amount of control over the production process by controlling access to key resources and activities, such as product design, international brands, and access to final customers.[3] A production chain becomes global when the linkages fragment across countries.

9. Figure 2 illustrates the network structure of global supply chains, global value chains, and global production chains. The structure of global supply chains and global value chains are similar. However, the focus of global supply chains is moving goods and services through the stages of the network, whereas, the focus of global value chains is on the creation of value in the various places (or countries) in the network. Global production chains focus on the production of goods and services and typically end at the point after the goods and services have been produced for the lead enterprise.

Figure 2. Global value/supply/production chains



Source: Asia-Pacific Economic Cooperation (APEC) Policy Support Unit, issues paper no.1 "Concepts and Trends in Global Supply, Global Value and Global Production Chains"
Notes on Figure 2:
* Traditionally, conception, design and product development are controlled by the lead firm; nowadays, some of these activities are outsourced to other firms.
**The players in global production/supply/value chain include domestic and foreign firms.

[2] Asian-Pacific Economic Cooperation (APEC) Policy Support Unit, issues paper no.1 "Concepts and Trends in Global Supply, Global Value and Global Production Chains" May 2012

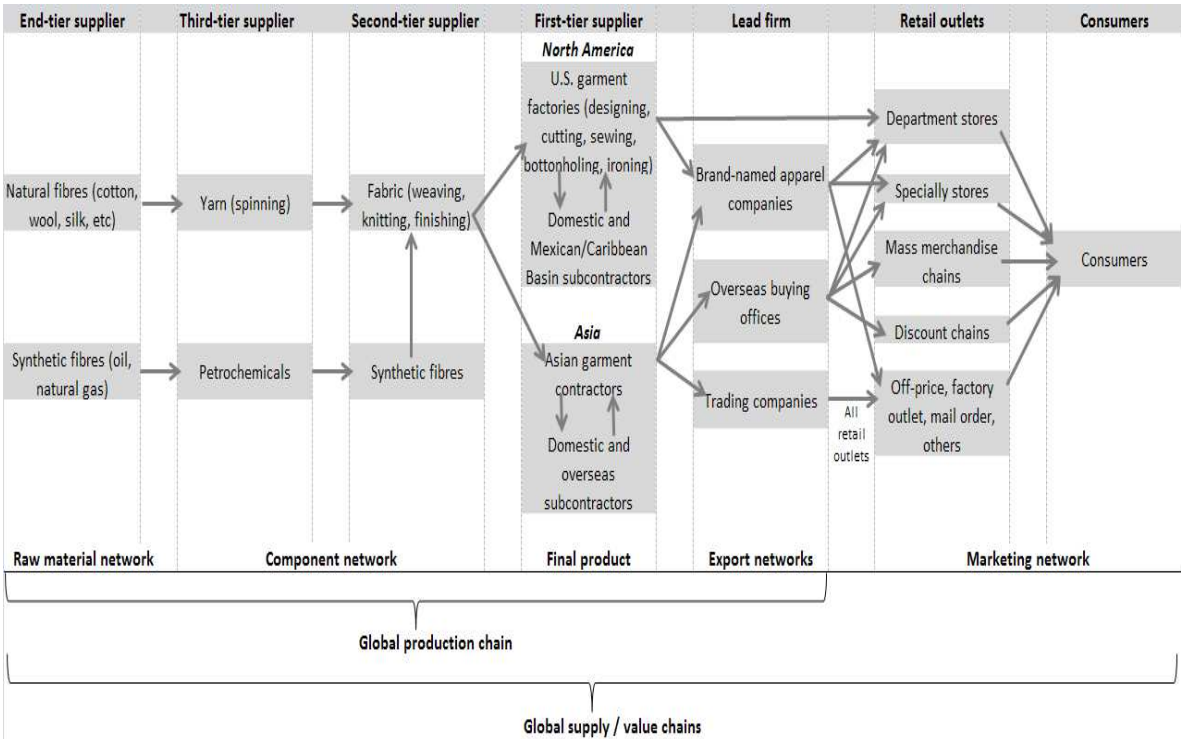
[3] APEC

10. Figure 2 is organized to show the interaction of the lead firm or enterprise, the suppliers, the distribution outlets, and the consumer. The lead firm, the principal, normally exerts some amount of control and contributes market knowledge, intellectual property, system integration and cost management skills. The lead firm's brand name usually reflects its reputation for quality, innovation, and customer service.

11. Multiple levels of suppliers may be needed by the lead firm for producing its specific goods or services. The lead firm works directly with the first-tier supplier. The first-tier supplier generally provides design and innovation capabilities. The second-tier supplier is an entity that supplies directly to the first-tier supplier without supplying directly to the lead firm. Raw materials are generally supplied by the end-tier supplier.

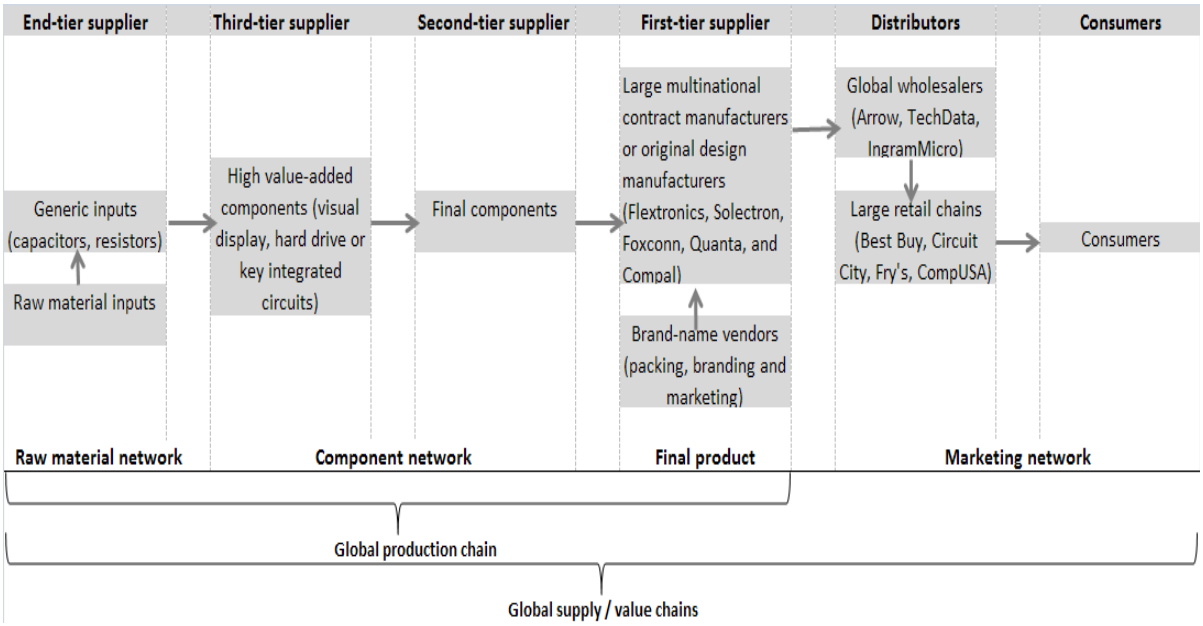
12. Examples of the network structure of global supply chains, global value chains, and global production chains for apparel and electronics are provided in figure 3 and figure 4, respectively.

Figure 3: Example of global value/supply/production chains for apparel



Source: Gereffi G. and O.Memedovic (2003), The Global Apparel Value Chain, UNIDO as printed in APEC issue paper.

Figure 4: Example of global value/supply/production chains for electronics



Source: APEC issues paper no.1 "Concepts and Trends in Global Supply, Global Value and Global Production Chains"
Note: There is no overall lead firm in this diagram. Please refer to the multi-polar chain.

13. There are three main types of value chains: producer-driven, buyer-driven, and multi-polar. [4] In producer-driven chains, the lead firms are usually involved in the upstream end of the chain (R&D and design). The lead firm plays a central role in coordinating a geographically distributed network of suppliers. These chains are most often found in high-tech goods that embody specialized design, complex production processes, and extensive R&D, such as electronics, semiconductors, computers, and pharmaceuticals. Buyer-driven chains are more often associated with standardized, lower-tech goods such as apparel. In a multi-polar chain there is no overall dominant lead firm shaping the final product. This type of chain is less common and is characterized by multiple power centers in different parts of the value chain, but the firms involved in the various parts exert control over certain key activities throughout the chain. In the APEC paper, figure 4 is given as an example of a multi-polar chain because Intel, Microsoft, and Fujitsu, are lead firms in their own production chains within the personal computer global value chain. The personal computer marketed by Fujitsu incorporates Microsoft's software, Intel's semiconductors, and Fujitsu's customer-based brand reputation and marketing strategy.

Section 2: Organization of Production Arrangements

14. The increased fragmentation of production and trade through the use of supply chains is in large part due to enterprises focusing on their core competencies and competitive advantages. The focus may be on innovation and product strategy, marketing, and the highest value added segments of manufacturing and services; therefore, reducing the direct ownership over "non-core" tasks such as ancillary services and volume production.

15. Outsourcing refers to service or manufacturing activities that are contracted out to unrelated firms located either in the home country or abroad and is generally meant to be applicable to those

[4] APEC issues paper no. 1.

activities that were once internal firm functions. In the case of factoryless manufacturing, the term outsourcing may be used more broadly to refer to activities that are contracted out but were never part of internal firm functions. Offshoring originally referred to service or manufacturing activities within the supply chain that are carried out by affiliates located in foreign countries. However, offshoring is now commonly used more broadly to refer to activities done abroad through both foreign affiliates and independent contracts. The provision of service or manufacturing activities by a domestic firm to a firm abroad is known as inshoring.[5]

16. Enterprises are continually evaluating which tasks may be outsourced and where offshoring is advantageous. Whether an enterprise chooses an affiliate versus independent firm is determined in part by the nature and maturity of the product. If the product is new and embodies substantial intellectual property, enterprises may be less likely to offshore tasks. This may be due to the risk that intermediate goods may not be made to exact specifications but may also reflect concerns about enforcement of contractors or property rights abroad.[6] Once a product is more standardized, firms are more likely both to offshore tasks and to do so using independent contractors.

17. Gereffi and others provide three dimensions for understanding how production arrangements are organized and which tasks are likely to be performed in-house and which tasks are likely to be outsourced.[7]

1. Complexity of information and knowledge required for the transactions (product and process specifications).
2. The degree to which this complexity can be mitigated through codification.
3. The extent to which suppliers have the necessary capabilities to meet the buyers' requirements.

18. By assigning different values (low or high) to the key dimensions two opposite ends of a production chain can be identified for what type of business relationship arises among the participants. The five modes of governance that can exist in global value chains are Market, Modular, Relational, Captive, and Hierarchy. These governance types range from market oriented production arrangements where the lead enterprise exerts little control over the production process to the other end of the spectrum where the lead enterprise exerts full control over the production process. In market oriented relationships, specifications are simple and suppliers do not need specific information from sellers on how to make the product. These production arrangements are generally associated with arm's length transactions in competitive markets between unrelated enterprises where prices are the main decisive factor.

19. In the modular governance type the lead enterprise provides specifications to the supplier. These linkages are based on codified knowledge and provide many of the benefits of market linkages but are not the same as market exchanges based on price. When the lead enterprise provides the supplier with the specifications more than just information about prices is exchanged, but because of codification, complex information can be exchanged without little explicit coordination. The supplier takes full responsibility for competencies surrounding process technology and make capital outlays for components and materials on behalf of customers.

20. In the relational governance type the interactions between the buyers and sellers are mutually dependent. The product specifications cannot be codified, but the capabilities of the supplier are high providing a strong motivation for lead enterprises to outsource to gain access to complementary competencies. The exchange of complex tacit information is governed by high levels of explicit coordination.

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[5] U.S. International Trade Commission "Economic Effects of U.S. Import Restraints, Special Topic: Global Supply Chains," August 2011.
[6] U.S. International Trade Commission
[7] Gereffi, G., J. Humphrey & T. Sturgeon (2005) "The governance of global value chains", *Review of International Political Economy*, 12:1.

21. At the other end of the governance types, fully integrated production arrangements are needed because the products are complex, specifications are not easily standardized, and competent independent suppliers cannot be found. Under this hierarchal governance type, the lead enterprise maintains full control through direct ownership of the production process. The enterprise develops and manufactures the products in-house because the exchange of knowledge is considerable with managerial control flowing from headquarters to affiliates.

22. These different types of arrangements can be helpful in identifying how much explicit coordination takes place and can be an indication of how much control (and the associated risk) the lead enterprise has over the production process. Where the governance type is Captive, unaffiliated contract manufacturers can also be part of the production chain. In this situation the unaffiliated contract manufacturer is engaged by a single principal and is entirely dependent on this relationship to obtain work for his plant or plants. It can also be the case in such scenarios that the difference between an affiliate and an unaffiliated contract manufacturer can be very unclear. The control exerted by a principal on a captive unaffiliated contract manufacturer can be practically the same as the control exerted by the multinational enterprise (MNE) parent in a direct investment relationship on its affiliate.

23. One important aspect of the governance discussed by Gereffi and illustrated in the supply chain figure 1, is the role of technology and knowledge management. Global production arrangements constitute much more than simply a sequence of interlinked markets. As illustrated in figure 2, production chains are importantly characterized by the information streams required to connect principals, the lead firms coordinating the tasks, and suppliers. This knowledge aspect of global production chains clearly has a linkage to management of the supply chain and exchange of intellectual property.

Section 3: Typology of global production arrangements

24. This section will focus on global production chains as described in section 1, where a lead enterprise arranges their particular network of suppliers to produce a given good or service. The typology discusses the different global production chains and translates the various types into the current interpretation of the international standards. In reading this section it will become clear that further consideration may be necessary on some aspects of the various global production arrangements and later chapters will address these issues.

25. The main objectives of developing this typology are the following. First, it supports the proper breakdown of economic activities along the global production chain on a country-by-country basis. Secondly, it helps in assigning the kind of economic activity of a principal — an enterprise that exerts a certain level of control over the production process — and supplier —contract manufacturers, goods producers, and other participating units in the global production chain. Thirdly, the typology assists in identifying the economic ownership of inputs, outputs, and intellectual property for the activities along the production chain. Fourthly, the typology helps identify the type of output (goods, trade margins, services) of the participating units in the global production chain.

26. To better understand the various types of global production arrangements it is useful to look at the entire production process from the viewpoint of the domestic entity involved in the production chain. For national accounting purposes, it is important to identify the economic activity of each of the participating units in the production chain as well as the value added of each unit. The typology uses the ISIC industry classification system that groups producing units into detailed industries based on similarities in the economic activity, taking into account the inputs, the process and technology of production, and the characteristics of the outputs. Also important in properly classifying the

economic activities of the entities involved is the ownership of the material inputs, intangible inputs, and outputs at each stage of the production process.

27. Table 1 describes global production arrangements for producing goods and services from the viewpoint of the domestic entity and reflects the various combinations of economic ownership of the inputs and outputs in the production chain. If the domestic entity is the principal who is the lead enterprise coordinating the production chain the table identifies the domestic entity as principal. To address the various boundary issues of global production arrangements, all combinations of economic ownership are discussed, so the table addresses the case where there is no lead enterprise identified in the table.

28. Table 1 indicates the economic engagement between the principal and supplier in terms of production and does not necessarily designate direct investment relationships; the supplier may, or may not, be owned by the principal. The table assumes that economic ownership of the materials, the intellectual property, and output can be assigned to the principal or the supplier, but in practice this may be difficult to assign. Chapters 2 and 3 of this guide address the principles of economic ownership of the material inputs and intellectual property, respectively.

29. Table 1 provides at least two important points regarding global production arrangements for making and selling goods. First, economic ownership of material inputs does not necessarily coincide with economic ownership of outputs. Second, while table 1 shows a variety of arrangements for goods production in terms of ownership of material inputs, intellectual property inputs, and outputs, the international guidelines consider ownership of material inputs the single decisive factor in determining the economic engagement of supplier and principal involved in goods production. Under ISIC classification rules, "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." (ISIC rev. 4) For ISIC, a unit that outsources transformation but owns material inputs is a manufacturer and a unit that outsources transformation and does not own material inputs is treated as being engaged in trade.

30. As Table 1 shows, economic ownership is not only important for the type of economic activity in terms of industry classification but also the type of output the unit produces and how the international trade flows related to production are recorded.

Table 1. Types of global production processes and transactions involved*

Description of production process from point of view of domestic entity	Entities involved	Economic activity	ISIC Industry	Economic ownership of			Type of output	International transactions related to production process
				Materials	Intellectual Property	Output		
A. Transformation of materials owned by domestic principal	Domestic entity (Principal)	Manufacturing	Manufacturing	+	+	+	Goods	Goods for processing treatment: if good is returned to domestic entity's country of residence, only the net value of manufacturing services will be registered as imports of service. Materials sent for processing are excluded from general merchandise exports; Goods returned after processing are excluded from general merchandise imports. If good remains in supplier's country or sent to third country then recorded as exports of general merchandise from domestic entity's country.
	Supplier	Manufacturing service provider	Manufacturing				Services	Exports of manufacturing services from supplier's country to domestic entity.
B. Merchant	Domestic entity	Merchant	Trade			+	Services (Margin on Goods)	For goods that do not enter the domestic entity's territory, gross value of exports from domestic entity less value of supplier's exports (Goods under merchanting). If goods enter the domestic entity's territory then imports of general merchandise are recorded (value of supplier's exports).
	Supplier	Manufacturing	Manufacturing	+	+		Goods	Exports of general merchandise from supplier's country.
C. Factoryless manufacturing	Domestic entity (Principal)	Factoryless production or acting as "converter"	Trade?		+	+	Services (Margin on Goods)	For goods that do not enter the domestic entity's territory gross value of exports from domestic entity less value of supplier's exports (Global Production/Goods under merchanting). If goods are returned to domestic entity's territory imports of general merchandise are recorded (value of supplier's exports).
	Supplier	Manufacturing	Manufacturing	+			Goods	Exports of general merchandise from supplier's country to domestic entity.
D. Fragmenting part of production of services, IPPs	Domestic entity (Principal)	Production of services	Appropriate service Industry		+	+	Services	Imports of services (by type) from supplier's country. If domestic entity then sells the service abroad, then Gross value recorded in exports of services (by type) from domestic entity's country;
	Supplier	Production of services	Appropriate service Industry				Services	Exports of services (by type) from supplier's country to domestic entity.
E. Fragmenting part of production of services, excluding IPPs	Domestic entity (Principal)	Production of services	Appropriate service Industry			+	Services	Imports of services (by type) from supplier's country. If domestic entity then sells the service abroad, then Gross value recorded in exports of services (by type) from domestic entity's country;
	Supplier	Production of services	Appropriate service Industry		NA		Services	Exports of services (by type) from supplier's country to domestic entity.
F. Subcontracting production of services	Domestic entity (Principal)	Purchase and sale of service without any significant transformation of the service between purchase and sale	Appropriate service Industry			+	Services	Imports of services (by type) from supplier's country. If domestic entity then sells the service abroad, then Gross value recorded in exports of services (by type) from domestic entity's country;
	Supplier	Production of services	Appropriate service Industry				Services	Exports of services (by type) from supplier's country to domestic entity.
G. Direct Investment Enterprise not directly engaged in producing the good	Domestic entity	Financial and business services	Section M				Services	None
	Supplier	Manufacturing	Manufacturing	+	+	+	Goods	Exports of general merchandise from supplier's country.
H. Direct Investment Enterprise not directly engaged in producing the service	Domestic entity	Financial and business services	Section M				Services	None
	Supplier	Production of services	Appropriate service Industry	+	+	+	Services	Exports of services from the supplier's country.

*Based on in-depth review on global manufacturing prepared by Statistics Netherlands

31. The following section provides simple examples of the global production arrangements presented in table 1. The arrangements are grouped into: (I) global production arrangements related to goods production; (II) global production arrangements related to services production; and (III) global production arrangements that are not the primary inputs into the primary product. The cases describe global production arrangements where the principal is located in one country and the supplier in another country.

I. Global Production Arrangements Related to Goods

Case A: Transformation of materials owned by domestic principal

32. Under this global production arrangement the domestic principal owns the materials and purchases manufacturing services from a foreign supplier to transform the physical inputs into another product. For example, the principal is engaged in making athletic shoes. The production of this shoe can be divided into three main parts: (1) the top of the shoe, called the upper; (2) the midsole, the most important part of this athletic shoe because it is the part that cushions and protects the foot; and (3) the outsole. Suppose the principal created a new innovative design that cushions the foot and provides for better athletic performance. The principal produces the newly designed midsole at its domestic manufacturing plant. However, the principal decides that it is more cost effective to send the midsole and the other materials (the upper and the outsole) it has manufactured to another country for final assembly. There is no change in ownership of the various parts of the shoe sent abroad for further processing; the principal simply pays a processing fee to the supplier to assemble the shoe. The shoe is marketed and sold by the principal, so it owns the output and receives the revenue. The principal may or may not take physical possession of the final output. The output could be shipped directly from the processor to the final buyer in the principal's country; the output could remain in the processor's country; or the output could be shipped directly to another country.

33. The key points are:

- The supplier only receives a processing fee in this scenario. The fee is not the full value of the final good; it is simply the fee to assemble the shoe.
- The principal is the economic owner of the materials, the intellectual property (the innovative design of the midsole), and the output.

34. Under this scenario both the principal and supplier are classified in the manufacturing sector. The principal reports the revenue it received from selling the shoes at full value. The processor reports the revenue it received from contract work (not an imputed value for the shoe). This is the standard "goods sent abroad for processing" case as discussed in the Systems of National Accounts (SNA 2008) and the Balance of Payments Manual version 6 (BPM 6). [8]

35. The following numerical example illustrates this global production arrangement. Before the "goods sent abroad for processing" global production arrangement is discussed let us first discuss the case where the production process required to make the good is entirely carried out by the principal enterprise in country A and is exported to country C. From this starting point, the examples will change slightly using the data supplied in Table 2 illustrating the breakdown of the value of the athletic shoe sold to the customer in country C. The following set of examples are used to illustrate the various global production arrangement discussed in cases A through C.

[8] See System of National Accounts SNA2008 at unstats.un.org/unsd/nationalaccount/docs/SNA2008.pdf and Balance of Payments Manual version 6 at http://www.imf.org/external/pubs/ft/bop/2007/bopman6.htm.

Table 2. Hypothetical Allocation of Value of Athletic Shoe

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

Example A1 Athletic Shoe

36. The principal maintains two types of establishments in country A, a manufacturing establishment responsible for producing shoes and a wholesale establishment responsible for marketing and selling the shoes. The manufacturing establishment purchases material inputs, such as leather, valued at 30 and transforms the material inputs into the athletic shoes valued at 85. The wholesale establishment sells the shoes to a customer located in Country C for 110. Table A1.1 illustrates the industry account of the principal in country A.

Production process is entirely performed by principal in country A

Table A1.1. Industry Account
Principal
Country A

	Manufacturing	Trade	Total
Gross Output	**85**	**25**	**110**
Goods	85	0	85
Services	0	25	25
Intermediate inputs	**33**	**4**	**37**
Materials	30	0	30
Processing services	0	0	0
Other services	3	4	7
Value added	**52**	**21**	**73**

37. Table A1.2 further breaks down the components of value added of the principal that represents the return to labor in the form of compensation and the return on capital which includes the remuneration of the return on the intellectual property embedded in the product and the trade margin for selling the good.

Table A1.2 Components of Value Added
Principal
Country A

	Manufacturing	Trade	Total
Compensation	22	15	37
Taxes on production and imports less subsidies	0	0	0
Gross Operating Surplus (GOS)	30	6	36
Value added	**52**	**21**	**73**

38. Table A1.3 illustrates the related international transactions between country A and country C. Country A registers an export of a good (the shoe) to country C.

Table A1.3 International Transactions

	Country A	Country C	Total
Exports	**110**	**0**	**110**
Goods	110	0	110
Services	0	0	0
Imports	**0**	**110**	**110**
Goods	0	110	110
Services	0	0	0

Example A2 Athletic Shoe

39. There are varying degrees of how much transformation the principal performs in-house versus through the use of contract manufacturers. The principal may perform some of the transformation required to make the good or may not perform any of the transformation but purchase all the required material inputs to make the good and send those materials to the supplier for final assembly. The following example illustrates the case where the principal purchases all the required material inputs, but does not perform any transformation.

40. The principal decides to contract with a supplier in country B to assemble the athletic shoes. The principal in country A purchases the material inputs from a materials supplier in country A and sends those materials to country B for processing. In addition, the principal retains the rights to the intellectual property and informs the supplier how to assemble the shoe. The supplier now supplies all the production workers required to make the shoe.

41. The principal maintains two types of establishments in country A, an establishment responsible for managing the production of the shoes through the use of contract manufacturers who transform the materials still owned by the principal (classified within manufacturing) and a wholesale establishment responsible for marketing and selling the shoes. The manufacturing establishment pays the supplier in country B a processing fee for assembling the shoe of 20. The wholesale establishment sells the shoes to a customer located in Country C for 110. Table A2.1 illustrates the industry account of the principal in country A and the supplier in country B.

42. The same hypothetical values as shown in Table 2 are applicable for illustrating example A2. To keep the example simple, the value added of the supplier is only the compensation of the

production workers the supplier hires to assemble the shoe. In addition, there is no assumed efficiency gained from using the contract manufacturer to produce the shoe.

Processing on physical inputs owned by principal in country A and supplied to processor in country B

Table A2.1 Industry Account

	Principal Country A			Supplier Country B
	Manufacturing	**Trade**	**Total**	**Manufacturing**
Gross Output	**85**	**25**	**110**	**20**
Goods	85	0	85	0
Services	0	25	25	20
Intermediate inputs	**53**	**4**	**57**	**0**
Materials	30	0	30	0
Processing services	20	0	20	0
Other services	3	4	7	0
Value added	**32**	**21**	**53**	**20**

Table A2.2 Components of Value Added

	Principal Country A			Supplier Country B
	Manufacturing	**Trade**	**Total**	**Manufacturing**
Compensation	2	15	17	20
Taxes on production and imports less subsidies	0	0	0	
GOS	30	6	36	0
Value added	**32**	**21**	**53**	**20**

43. Table A2.3 illustrates the international transactions on a balance of payments basis. Because the merchandise trade statistics are compiled based on customs documents that reflect the physical movement of goods across borders, the merchandise trade data must be adjusted to accord with BPM6 and SNA2008 concepts. In this example, the materials, such as leather, required to make the athletic shoe are sent from country A to country B without a change in ownership; therefore, negative adjustments are needed to remove the materials sent from country A to country B because there is no international transaction. Similarly, the shoes that are sent directly from the processor in country B to the customer located in country C should be removed from country B's merchandise trade exports.

44. In addition, since the principal in country A sells the shoes to a customer located in country C without the shoe entering the customs territory of country A then positive adjustments are needed to add the goods sold abroad after processing to align the transaction to a balance of payments basis. [9]

[9] For information on reconciliation between merchandise source data and total goods on a balance of payments basis see BPM6 Table 10.2.

Table A2.3 International Transactions

	Country A	Country B	Country C	Total
Exports	**110**	**20**	**0**	**130**
Goods	110	0	0	110
Services	0	20	0	20
Manufacturing services on physical inputs owned by others	0	20	0	20
Imports	**20**	**0**	**110**	**130**
Goods	0	0	110	110
Services	20	0	0	20
Manufacturing services on physical inputs owned by others	20	0	0	20

45. Example A2 just discussed illustrates the case where the principal purchases all the required material inputs and the supplier does not purchase any of the materials. However, in some processing arrangements, the supplier may purchase some of the material inputs. BPM6 indicates that a manufacturing service fee could include the cost of materials purchased by the processor.[10] There are no clear cutoffs indicating the amount of material inputs that can be purchased by the supplier and still be included as a case of "manufacturing services on physical inputs owned by others" but most interpret this to mean that the material inputs supplied by the processor are incidental and should not be a large proportion of the material costs.

Country Case Study 1: Goods for processing sent to third countries

This case is about a Multinational Enterprise (MNE) in the motor vehicle industry with the headquarters located in Country A and foreign affiliates in different countries. This enterprise manufactures motor vehicle parts, mostly in Country A, where the company is classified under ISIC 29. These parts are exported to country B where the finished product is assembled by a foreign affiliate (ISIC xxx). The headquarters in country A also buy other parts which are needed for the manufacturing of the final product from companies that are not part of the MNE in third countries. These other parts are sent directly to the foreign affiliate in country B. The finished product is not exported back to Country A. In this production process the headquarters in country A consider that they own the inputs and the intellectual property products all the time until the finished product is sold.

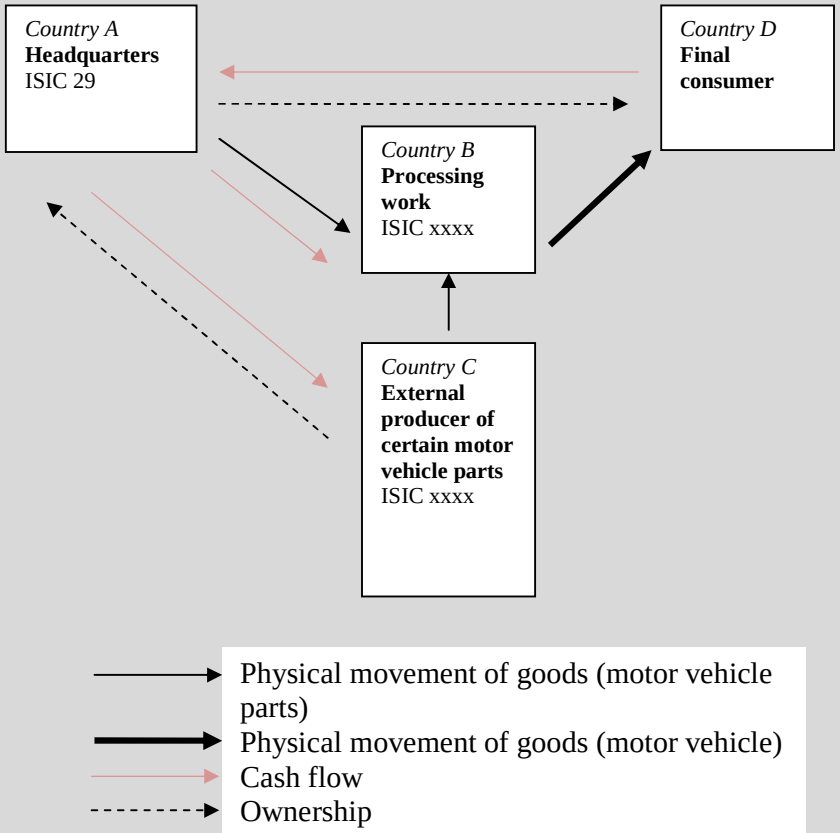
In the Country A's foreign trade statistics in goods and services, the value of the exported parts is reported at the value of the parts, i.e. without the processing value and at a much lower value than the finished product. Nor the value of the other parts imported from third countries used in the processing neither the cost of the processing are included in the import figures in the trade statistics of country A. However, the finished product is invoiced from Country A and the full value of the finished product, including profit (as a compensation for management, design, R&D carried out in country A) and the cost of the processing and the parts imported from third countries, is reported in the SBS as a production of motor vehicles. This results in discrepancies when balancing the output and the

[10] BPM6 paragraph 10.64.

intermediate consumption with the export and import figures. Since the foreign trade in goods statistics do not collect data according to the change of ownership principle, the Large Enterprise Unit at the NSI in country A is in contact with the enterprise to obtain the data regarding the cost of processing in country B and the other parts imported directly from third countries to country B separately. Therefore, the foreign trade and the intermediate consumption figures can be adjusted[11]. There are still some problems concerning the collection of data on inventories abroad.

In accordance with SNA 2008, the country B, from which the finished product is exported to third countries, only exports a processing service to Country A and sends the product to a third country in accordance to SNA 2008.

Chart 1: Goods for processing sent to another countries



Case B: Merchant

46. Under this global production arrangement the domestic entity buys the shoe from the supplier and resells it without further transformation. The domestic entity did not provide any of the material inputs or any information to the supplier to help design the shoe. If the domestic entity purchases a good from a supplier abroad and resells that good to a customer located abroad, then the activity falls

[11] That means that the export data in country A show the value of the final vehicle sold to the final costumer outside the country A. The import and the intermediate consumption data in country A include the import of a processing service and the purchase of other motor vehicle parts from third countries sent to country B.

under the "merchanting" case as discussed in the SNA 2008 and BPM6. The domestic entity is simply a trader that buys the shoes from the supplier in country B and sells them to a customer located in country C.[12]

47. The key points are:

- The goods never entered the domestic entity's territory, but the sales are credited to the domestic entity.
- The physical form of the goods, while owned by the domestic entity, did not change (no substantial transformation occurred).

48. In this simple case the domestic entity purchased and resold the goods abroad. The domestic entity did not own the material inputs or the intellectual property, but did take ownership of the shoes before selling them to the customer located in country C. Following the merchanting recording of the trade flows, the domestic entity's country records a negative export when the good is acquired and a positive export when the good is sold.

49. Under this scenario the domestic entity is classified in the trade sector (either in the wholesale trade sector if the unit is primarily engaged in the intermediate step in the distribution of merchandise, or in the retail trade sector if the unit is primarily engaged in the final step in the distribution of merchandise). Its output would be the margin on the sale. The foreign supplier is classified in the manufacturing sector and reports the full value of the shoe in its turnover.

Example B1 Athletic Shoe

50. Continuing with the athletic shoe example as described in Table 2. The domestic entity, the principal, in country A is only responsible for marketing and selling the shoe and has no control or input in the production of the shoe. The principal's output is the margin on selling the shoe. The supplier in country B purchases the materials and receives the returns to the intellectual property embedded in the shoe. The example shown is the case where the domestic entity located in country A purchases the shoe from the supplier located in country B and sells the shoe to a customer located in country C. The shoe does not enter the principal's territory before being sent to country C.

Table B1.1 Industry Account

	Principal Country A Trade	**Supplier Country B Manufacturing**
Gross Output	**25**	**85**
Goods	0	85
Services	25	0
Intermediate inputs	**4**	**33**
Materials	0	30
Processing services	0	0
Other services	4	3
Value added	**21**	**52**

[12] If the domestic entity buys the good from the supplier located in country B and sells the good to a customer located in the domestic entity's country A then, the value of the finished good is included in country A's merchandise imports (i.e., a merchanting transaction is not recorded because the good enters the domestic entity's territory).

Table B1.2 Components of Value Added

	Principal Country A Trade	Supplier Country B Manufacturing
Compensation	15	22
Taxes on production and imports less subsidies	0	0
GOS	6	30
Value added	**21**	**52**

Table B1.3 International Transactions

	Country A	Country B	Country C	Total
Exports	**25**	**85**	**0**	**110**
Goods	25	85	0	110
Net exports of goods under merchanting	25	0	0	0
Goods acquired under merchanting	-85	0	0	0
Goods sold under merchanting	110	0	0	0
Services	0	0	0	0
Imports	**0**	**0**	**110**	**110**
Goods	0	0	110	110
Services	0	0	0	0

51. There are variations in the types of arrangements that fall under this global production arrangement. For example, the good could be bought by the principal located in country A and sold to a customer located in the supplier's country B.[13] Also, some minor processing that does not lead to substantial transformation could occur after the good is bought by the domestic entity. If some processing took place in country B or country C or another country there would also be some manufacturing services to record.

Case C: Factoryless Manufacturing

52. Under this global production arrangement a factoryless producer provides the intellectual property products to the supplier as inputs into the production process; in other words the principal supplied the "blueprints" for production. For example, suppose the principal creates a new and innovative midsole that improves the athletic performance of runners. The principal contracts with a supplier to make the shoe. The principal provides the supplier with the design and the specifications for making the shoe. The principal did not provide any of the required material inputs (the supplier purchased those materials). However, the principal is responsible for marketing and selling the shoe and receives the revenue.

[13] If the domestic entity buys the good from the supplier in country B and subsequently sells that good to a customer located in country B then country A would record the transaction as a merchanting transaction (i.e., country A would record a negative export of a good from country B and a positive export of a good to country B). Country B would record an export of a good to country A and an import of a good from country A.

53. A factoryless manufacturer controls the delivery of its products to consumers. The supplier delivers predefined products to the principal at predetermined prices and cannot sell its output to other parties other than the principal. A factoryless manufacturer may provide substantial inputs in the form of R&D and other intellectual property embedded in the good— it may be most of the value of the finished product. Because the return on the intellectual property embedded in the good is received by the factoryless manufacturer (and not the supplier) the margin on the sale of the good is higher than a trade margin associated with only the distribution of goods. The value added as a share of the total revenue received would be higher and in some cases substantially higher as seen in the Linden et al "iPod" case study where a large part of the wholesale value represents the return on the intellectual property and design.[14]

54. Determining the industry classification of this type of producer is not straightforward. Under traditional manufacturing arrangements, the ownership of the material inputs and the ownership of the output coincided. Now there are cases, especially in the production of many high tech products, where this traditional relationship does not hold. In these cases, it is the ownership of the intellectual property and the ownership of the output that coincide. As was stated earlier, the ISIC rev. 4 recommends classifying units that do not own the material inputs in the trade sector. This classification may be problematic because the value of the trade sector's output, the gross margin, is typically associated with only the distribution of goods and not with the return of the intellectual property embedded in the good. A discussion of whether this is the appropriate classification of these units is discussed in chapter 2 and chapter 9.

Example C1 Athletic Shoe

55. Continuing with the athletic shoe example as described in Table 2. The principal in country A outsources the transformation of its athletic shoe to a foreign supplier located in country B. The principal controls the production of the shoe by providing the supplier the blue prints of production. The principal maintains ownership of the intellectual property embedded in the shoe as well as being responsible for marketing and selling the shoe. The supplier purchases the materials and sells the shoe to the principal at a value that includes the materials plus the value of the processing (compensation of the production workers).

Table C1.1 Industry Account

	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**

Table C1.2 Components of Value Added

	Principal	**Supplier**

[14] Linden, G., K.L. Kraemer, & J. Dedrick (2007) "Who Captures Value in a Global Innovation System? The case of Apple's iPod." UC Irvine: Personal Computing Industry Center (http://escholarship.org/uc/item/1770046n)

	Country A Trade	Country B Manufacturing
Compensation	17	20
Taxes on production and imports less subsidies	0	0
GOS	36	0
Value added	**53**	**20**

56. If the shoe is returned to country A before being sold to country C then the related international transactions are as follows:

Table C.3.1 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

57. If the shoe is acquired by country A and sold to country C without the shoe entering the territory of country A then the related international transactions are as follows:

Table C1.3.2 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	0
Goods acquired under merchanting	-50	0	0	0
Goods sold under merchanting	110	0	0	0
Services	0	0	0	0
Imports	**0**	**0**	**110**	**110**
Goods	0	0	110	110
Services	0	0	0	0

Country Case Study 2: Multinational Enterprises Invoicing Arrangements

Change of invoicing managing

The following case illustrates how a change of the invoicing management of a MNE in country A affected the economic flows collected by the National Statistical Institution (NSI) and led to higher export and production figures in the national accounts of this country. The enterprise has its headquarters in Country A where it is classified as wholesale trade (ISIC 46) and foreign affiliates in many countries. They sell consumer products, which are designed in Country A and manufactured abroad in several countries. This manufacturing process is carried out by companies outside the MNE

in third countries. The headquarters own and control the design of the products that are sold to the final consumers.

The NSI in Country A discovered that the MNE changed its reporting starting at some point during the first decade of the 2000[15]. From that point the MNE started to report a high amount of merchanting. The reason was that they had reorganised their activities. The global total of their production (retail and wholesale margin) did not changed much, but the part registered in Country A increased very much.

Before the reorganization the foreign affiliates bought the products directly from the manufacturer and sold to consumers in the shops of the country of the foreign affiliate company. The foreign affiliates earned a retail margin and made a profit which to a large extent was transferred to Country A through dividends. Inventories were managed by each foreign affiliate.

A new unit was then created in Country A. This unit designs the products, makes contracts with manufacturing companies abroad, buys from manufacturing units abroad and keeps inventories abroad. This unit sells the products to the foreign affiliates in the different countries and the delivery of the products do not cross the country A's border. This means that a large part of the margin that earlier was produced by the foreign affiliates now turns up as wholesale margin (merchanting) in the new company in Country A. This also means that dividends paid by the foreign affiliates to Country A became smaller than before.

In the country of the foreign affiliate both the trade margin and dividends transferred to Country A become smaller. The products are imported into the country where it later will be sold and are put into an inventory and valued at purchasers' prices. This is probably reported as import of a good to the country valued in the same way as before since import of goods is reported according to when a border is crossed. The new unit in Country A considers that it owns the inventory even though it is located abroad. This unit then invoices the foreign affiliate for the wholesale value. The enterprise unit in Country A reports the margin earned abroad as income from merchanting. Apart from buying and selling they manage inventories abroad and design the products.

The new organisation has led to new merchanting figures and the Country A's level of GDP has increased substantially in current prices but the GNI is more or less the same since dividends from abroad are smaller(maybe with the exception of the first year when the dividends came from the year before with the old treatment).

[15] The survey of Foreign trade for services in country A asks for income from merchanting and the cost for the goods sold through merchanting. This means that new cases of problems with global manufacturing are discovered quickly. After two years the NSI then get results from the SBS, which also asks for merchanting.

Chart 1: enterprise flows before the reorganization

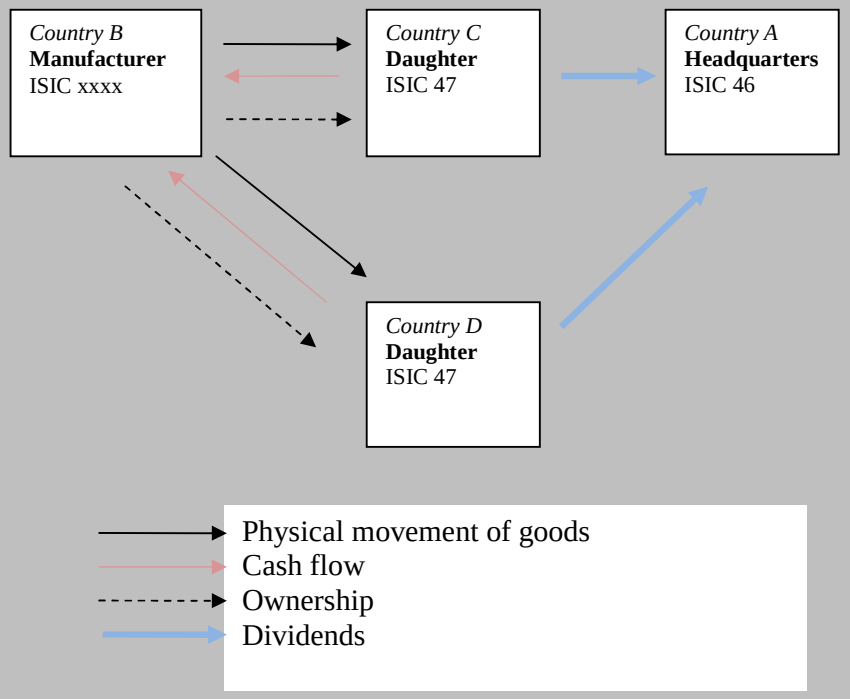
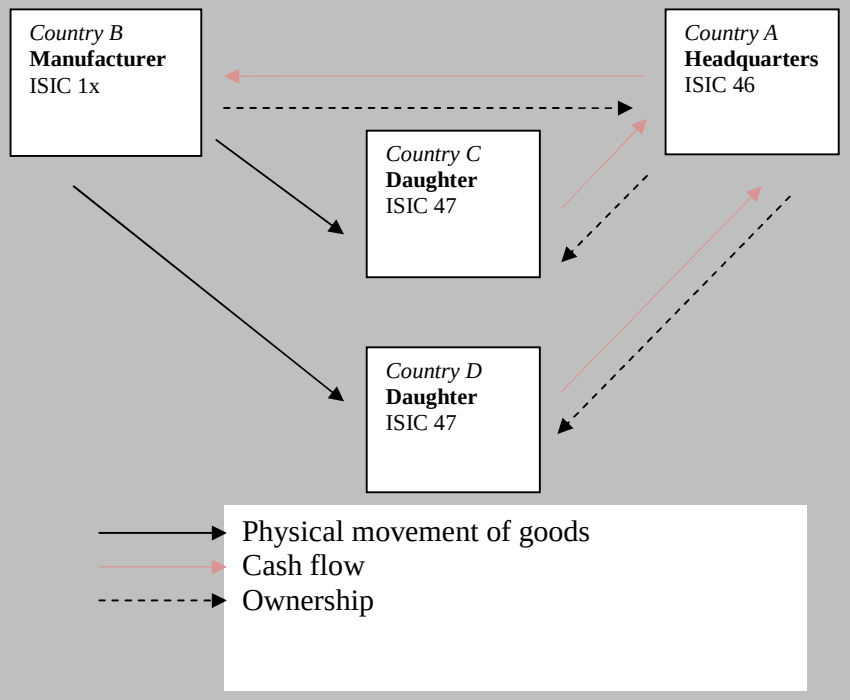


Chart 2: enterprise flows after the reorganization



Country Case Study 3: Example of factoryless manufacturers: Semiconductor Producers

The most common examples in this country are the many factoryless semiconductor producers. It seems that the semiconductor producers were the first to use a name for an enterprise engaging in such production – a fabless enterprise. According to the Fabless Semiconductor Association, “Fabless (without fab) refers to the business methodology of outsourcing the manufacturing of silicon wafers. Fabless companies focus on the design, development and marketing of their products and form alliances with silicon wafer manufacturers, or foundries.” Foundries are typically located in China because the generally low cost of labor, so fabless companies can benefit from lower capital costs while concentrating their research and development resources on the end market .The credit for pioneering the fabless concept is given to Bernie Vonderschmitt of Xilinx and Gordon A. Campbell of Chips and Technologies. The first fabless semiconductor company, the Western Design Center, was founded in 1978. Xilinx, founded in 1984, was the first to "truly" separate the design of chips from their manufacture". There also exists an international association, formerly called The Fabless Semiconductor Association and now Global Semiconductor Alliance (http://www.gsaglobal.org/), which has members described as "chip companies that don't own their own factories and that outsource manufacturing". Since design of semiconductors is often made in this country, there are a relatively large number of fabless semiconductor companies.

Typically a fabless semiconductor enterprise in this country has a management unit and a large R&D unit. During the development of the design, the testing of the semiconductor is performed at the enterprise of a subcontractor – often in Taiwan. At later stages the production is also performed by sub-contractors.

An example of such a factoryless semiconductor enterprise in this country: a fabless enterprise designs and markets finished products worth about a quarter of a billion dollars, which are produced by non-affiliated enterprises in an Asian country. The income of the domestic enterprise amounts to about 35% of the value of the production, so that the domestic share in the combined added value is quite high and may be assumed to reflect mainly the value of R&D performed within the country. In the financial reports the domestic enterprise registers the whole value of the sales of the final production as domestic income, so that on the one hand it is easy to collect many of the gross data needed to analyze the production processes taking place. However, on the other hand, in order to separate the activities between the countries, one has to collect data on the transactions taking place between the domestic enterprise, the producers abroad, and the customers, since no movement of goods has been observed in the foreign trade data, and the transfer of R&D to be used in the outsourced production also has not been recorded.

But also most textile companies in country, which formerly could be said to outsource production of goods as described in case A, can now mostly be described as factoryless enterprises.
Formerly the textile factories produced the fabric, which was then sent abroad for further processing in neighboring countries, where labor was relatively cheap and later returned to home country. But in recent years the subcontractors are not only in neighboring countries, but also in countries farther away – China, Vietnam, and India for example – and the sub-contractors also produce the fabrics.
Textile factoryless producers develop the designs of the fabrics and garments - give the instructions about which materials to use for producing the fabrics or garments, but don't engage in the actual production of the clothes. The production is often intended for the home country’s market, so that the products cross the home country’s border, but there has not been any previous transfer of goods for processing.

It can be said that almost the only textile factories, which continue to produce within home country, are factories engaging in production using more innovative methods, such as production of suits that "breathe", perhaps because they fear spill-over of the new inventions.

The measurement of factoryless production of goods (named "global manufacturing" in SNA 2008) has been attempted in this country in various ways during the recent ten years:

1. At the first stage lists of known factoryless producers of goods were obtained through the manufacturers association. Financial reports of the enterprises on the list were examined in depth in order to derive the flows to be included in the national accounts and the balance of payment. But it was clear that such lists were not exhaustive.

Later other methods were added to identify cases of factoryless production of goods. These methods involved comparisons of data from different sources – comparisons that are feasible since the authorities in this country use a single company identification number. The methods added:

2. Detailed banking data on transactions in foreign currency classified as exports of goods are 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, and data from the financial report have to be examined. However, some of the banking data may have problems of classification, and the timing may be different.

3. Yet another method used to find cases of factoryless production of goods is the comparison of data for enterprises covered in business surveys with customs data. Data on exports of goods are not obtained separately, so that the comparisons are less reliable, since exports of services are not covered in the customs authority files, but for most industries this comparison will be sufficient. The most important problem with this method is that currently data are only available for a sample of enterprises, and assuming that the sample is also representative for deriving factoryless production of goods may be problematic. However, since 2010 enterprises are obliged to report their financial reports on-line to the tax authorities, so that the frame for the business surveys may be improved very much, and parts of the information needed will be easy to obtain from the files of tax authorities.

4. A fourth method is the comparison of VAT data on exports with customs data on exports for individual enterprises. Whenever VAT data on exports for an enterprise are significantly higher than customs data, it may be suspected that there is a case of global manufacturing, and data from the financial report have to be examined. But since VAT data covers exports of both goods and services, the problem mentioned for business survey enterprises applies in this case too.

In the long run the intention is to capture factoryless production of goods in the framework of enterprise surveys. As a step in this direction the enterprise surveys on exports and imports of services are also used to capture data on factoryless production of goods, and from the 2009 survey all enterprises in the sample are questioned about outsourcing of production of goods across the border. The questions on outsourcing add to the response burden in a questionnaire that is already quite heavy. But most of the enterprises in the sample have submitted responses. The preliminary results from the 2009 survey have revealed that the arrangements for production are even more complicated than foreseen, when the questionnaires were prepared. Many of the enterprises engage in more than one form of global production – exporting and importing in connection with processing abroad (where goods return to home country), while also selling goods directly from a sub-contractor abroad or buying and selling finished goods abroad (merchanting activity). Some enterprises report that they pay sub-contractors, but don’t report return of products or sales abroad – perhaps because the sales take place in other periods. Further investigations need to be made, before the results can be included in a useful manner in the balance of payments and the national accounts. During the collection of data from the enterprises it also became clear that the distinction between merchanting and factoryless production of goods is not very clear, and enterprises needed further guidance, so that the questionnaire needs to be refined in the future. It is also important to find ways to improve the representativeness of the sample using the new administrative data obtained from the tax authorities from 2010.

Country Case Study 4: Norwegian Case Study Factoryless Manufacturing (furniture)

A former manufacturer of furniture, company X, closed down production in Norway. The production is transferred to subcontractors abroad, and company X is responsible for the design (blue print), testing of the products, marketing and sale. The goods that company X design (and in most cases take out a patent for) have developed over the years. Presently, production is concentrated on chairs for children, other equipment for the nursery, and prams.

Parts of the furniture and equipment are produced by subcontractors all over the world according to the blue print, the subcontractors chosen according to price and delivery reliability and quality. The different parts are sent to logistics centres. In the case of Europe, the logistic centre is located in the Netherlands. From the logistic centres the completed product is sent to the customer, and company X has full control of the delivery. According to the company, 96 per cent of the production is exported, while 4 per cent is for the domestic market in Norway. The sale income and costs can be traced in the business accounts of the company in Norway.

In the Norwegian Enterprise and Establishment Register, company X, as a factoryless manufacturer, is classified within trade and wholesale, as recommended in the ISIC rev. 4/NACE 2008 rev.2. However, determining the industry classification of a factoryless manufacturer is difficult. A special challenge with the company X case, is that is has elements of both not having ownership of the intermediate input (when the different parts are produced), and having ownership of the intermediate input (when the furniture etc are finalised in the Netherlands). The latter indicating treatment as goods sent abroad for processing. In addition, it can be argued that the intellectual property embedded in the blue print (which is patented) is a vital part of the finished goods. Should or could this fact lead to a different classification? If treatment as manufacturer was chosen, to which detailed industry group should it be allocated?

To sum up:

- Different goods, furniture, prams and other equipment for children are produced outside the territory of the principal (company X)
- The principal has no ownership to the materials used in production of the different parts of the finished goods, but has ownership to the parts which are put together in the logistic centre
- The principal maintains the ownership of the intellectual property embedded in the goods
- The principal is responsible for marketing and selling of the goods, and the sales are credited to the principal
- The goods never enter the principal's territory, except the 4 per cent which are for the domestic market
- There are no direct investments abroad

Challenges

The recording of company X as a trader is similar to the Athletic Shoe example as described in case 4 (the goods are not entering the territory of company X), except there are several suppliers from different countries involved, one of them being the logistic centre finalising the goods.

If the output is recorded are merchanting (service), it will equal the net exports (exports: goods sold under merchanting less negative exports: goods acquired under merchanting). Hence, exports from Norway, subdivided by countries, are classified as services. The question raised is, from which country are the goods (furniture) exported? From the recommendation regarding merchanting follows that the Netherlands should record exports of goods to Norway (negative exports of Norway). Concequently, there is no export of furniture except from the Netherlands to Norway. Probably, world input/output tables will be disturbed.

Another challenge is how to receive deflators (price indices) that are relevant for the output of merchanting, and consequently the exports of merchanting and negative exports (goods required for merchanting). In Norway, constant prices for margin production in trade and wholesale, is estimated based on mark up coefficients from the previous year.

As a consequence of challenges regarding constant price estimates, also productivity estimates are affected. In addition, as there are low capital investments related to the production, total factor productivity will be more or less equal to labour productivity and high compared to countries where the production of the goods take place.

58. Another type of factoryless production is when the domestic entity does not supply the "blueprints" for production but simply purchases goods from unaffiliated manufacturers and resells the goods under the domestic entity's brand name. This type of "branding" activity is more likely associated with "buyer-driven chains" that are generally led by firms involved in the downstream end of the chain, such as retailers.

59. However, a firm could be involved in a combination of global production arrangements where the firm is both involved in branding and outsourcing the transformation of a good that the firm designed. One such firm, a computer producer, states that they utilize a significant number of unaffiliated contract manufacturers around the world to manufacture products that they designed. The computer firm states that they use multiple contract manufacturers 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 they also purchase and resell third-party original equipment manufacturer (OEMs) products that they sell under their own-brand name.

60. The stylized arrangements discussed in this section are a highly simplified version of actual global production arrangements that can be very elaborate. The discussion above illustrates that a firm might use a combination of types of global production arrangements and national statistical offices might have difficulty distinguishing between a producer that is only branding products and a producer that provides the "blueprints" of the production process thus exhibiting more control over the production process.

61. Not all global production arrangements related to intellectual property fall under the factoryless manufacturing arrangement. The domestic entity may simply be involved with supplying the knowledge inputs and is not engaged in the production of the goods. For example, suppose the domestic entity creates a new and innovative midsole that improves the athletic performance of runners. The domestic entity sells the rights to use the design and the specifications for making the shoe to the supplier. The supplier is responsible for marketing and selling the shoe and receives the revenue. The domestic entity simply receives revenue from selling or licensing the design. This arrangement does not fall under a global production chain as defined in section 2 because the domestic entity is not the "principal" and is not arranging a supply chain to make a particular good or service. It is simply a participant in the supply chain and is exporting intellectual property products.

Example C2 Athletic Shoe

62. Continuing with the athletic shoe example where the breakdown of the value of the shoe is illustrated in Table 2. The unit in country A is transferring the rights to use the design and blue prints of how to make the shoe to 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 embedded in the shoe).

Table C2.1 Industry Account

	Country A Unit	Country B Manufacturing
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**

Table C2.2 Components of Value Added

	Country A Unit	Country B Manufacturing
Compensation	0	37
Taxes on production and imports less subsidies	0	
GOS	30	6
Value added	**30**	**43**

Table C2.3 International Transactions

	Country A	Country B	Country C	Total
Exports	**30**	**110**	**0**	**140**
Goods	0	110	0	110
Services	30	0	0	30
Charges for the use of intellectual property	30	0	0	30
Imports	**0**	**30**	**110**	**140**
Goods	0	0	110	110
Services	0	30	0	30
Charges for the use of intellectual property	0	30	0	30

II. Global Production Arrangements Related to Production of Services

63. While firms contract with other firms to provide support activities such as billing services or information "help" services the arrangements described below are meant to describe activities of firms whose primary activity is the production of services. The cases describe firms that fragment part of their services production to different countries and cases where firms fully outsource (subcontract) the production of the services that they sell as their primary product. There is a subtle distinction between fragmenting part of the production of services where the domestic entity remains in control of the

production of the primary service product and incorporates that part which was fragmented into the product versus the full subcontracting of the production of services where the domestic entity acts as a services arranger, who bundles and manages the services of the subcontractor(s).[16] The main distinction between these two types of arrangements is whether the domestic entity contributes to the production of the primary service product versus fully subcontracting out the production of the primary service product.

Case D: Fragmenting part of the production of services, Intellectual Property Products (IPPs)

64. In this case the domestic entity remains in control of the production process and owns the intellectual property and the output of the service produced. For example, a software firm in country A receives a contract to design customized software for another company in country B.[17] The software firm in country A employs computer programmers in-house to write the application, but also employs computer programmers located in country C to develop certain features of its application. The principal, the domestic software firm located in country A, owns the proprietary rights to the software being developed and is simply paying the supplier in country C a fee for providing the service. The supplier does not have economic ownership of the software that it is contracted to write.

65. Both the principal and the supplier are classified in the appropriate service industry; in the example illustrated in case D, both would be classified in the ISIC computer programming, consultancy, and related activities industry (Division 62- Computer programming, consultancy and related activities; Section J- Information and communication).

Case E: Fragmenting part of the production of services, excluding IPPs

66. In this case the domestic entity remains in control of the production process and owns the output associated with the service produced. Since the service product is not an IPP, the transfer of economic ownership of IPP is not applicable in this case.

67. For example, an accounting firm in country A receives a contract from a company in country A to audit the company's financial statements. The company has a subsidiary in country B. The domestic accounting firm in country A uses domestic employees to perform auditing services of the unit located in country A. Because in many parts of the world accounting firms are required by law to be locally owned and independent, the accounting firm in country A must contract with another accounting firm in country B, where the subsidiary is located, to perform the auditing service for the subsidiary's financial statements.

68. The accounting firm in country A provides auditing services to the company located in country A and receives the revenue directly from the customer located in country A. However, there is an international transaction involved because the accounting firm in country A purchases auditing services from an accounting firm in country B.

69. Both the principal and the supplier are classified in the appropriate service industry; in the example illustrated in case E, both would be classified in the ISIC Legal and accounting activities industry (Division 69- Legal and accounting activities industry; Section M- Professional, scientific and technical activities).

[16] Manual on Statistics of International Trade in Services (MSITS) 2010 paragraph 3.61 – 3.62.

[17] The customer could be located in the domestic entity's country—country A— or be located in the country of the supplier—country B.

Case F: Subcontracting production of services

70. Under this global production arrangement, the principal may subcontract its services provision. This could be considered in some ways similar to merchanting of goods as the services are purchased and resold without any significant transformation. The distinction between subcontracting of services and merchanting of services will be further discussed in chapter 5.

71. For example, a principal unit is paid to provide custom software services to a nonresident customer. The principal subcontracts to a nonresident contractor to provide the required custom software services. The principal pays the nonresident contractor for developing the custom software — taking ownership—and subsequently resells the custom software to the nonresident customer. The principal records the revenue received from the nonresident customer (recorded as exports of software services) and the expenditure for purchasing the custom software from the nonresident contractor (recorded as imports of software services).

72. The value of services exported and imported in the economy of the principal is recorded on a gross basis. This treatment is applicable because the principal buys and sells the services; if the principal acted as an agent on a commission basis (i.e., not taking ownership of the software), then only the commission would be recorded as the service provided by the principal. Both the principal and the supplier are classified in the appropriate service industry of their primary activity. In this example, both would be classified in the ISIC computer programming, consultancy, and related activities industry (Division 62- Computer programming, consultancy and related activities; Section J- Information and communication).

III. Global Production Arrangements Not Related to Primary Inputs Into the Production Process

Cases G and H: Direct Investment Enterprise Not Directly Engaged in Producing the Good or Service

73. In this global production arrangement the domestic entity is not connected to the production process in that it is not the economic owner of the inputs, intellectual property, or the outputs. Instead the domestic entity may simply act as a foreign direct investment enterprise and supply management type activities such as strategic or organizational planning. There may be international transactions related to the services supplied by the foreign direct investor, such as management or financial services, but no international transactions related to the primary inputs— the materials and intellectual property needed for producing the particular good or service— are recorded on the accounting records of the domestic entity resident in the economy.

Section4: Conclusions

74. The stylized arrangements discussed in section 3 are a highly simplified version of actual global production arrangements that can be very elaborate. A multinational enterprise can consist of many units producing an array of products across several countries and the accounting relationships can be complex. The lines between the various types of production arrangements can become quite blurred.

75. The main objective of the typology is to support the proper breakdown of economic activities along the global production chain on a country-by-country basis. The next step is testing the typology's usefulness and exhaustiveness based on a range of specific case studies for each type of global production arrangement discussed in the typology.

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