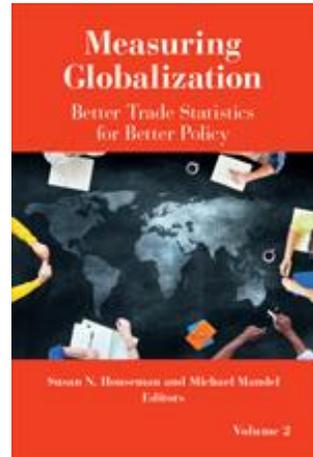

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BACKGROUND

The goal of a country's national statistical agencies is to provide relevant, timely, and accurate information on that country's economy.¹ Over time, as technology changes and organizations mature and change the way they operate, there can be changes in both the mix of outputs produced in an economy and in the way firms operate to achieve their goals. One of the biggest challenges faced by producers of national economic statistics is to adapt to these structural changes in the economy in order to continue to provide relevant data. Usually, structural economic alterations occur gradually over time; however, with the continual rapid technological advances of the past 20 years, there have been significant shifts in the way firms operate. Two of the biggest changes are the growth of global value chains and the fragmentation of production.

Global value chains and production fragmentation are interrelated phenomena. A value chain is the set of interrelated economic activities that contribute to the provision of a good or service, starting with product development and ending with customer service. When some of the economic activities occur in different countries, the chain is considered a global value chain (Center on Globalization, Governance, and Competitiveness 2006). A production chain is the set of economic activities within or among firms in a global value chain that are required to produce specific products. A production chain is typically controlled by a lead firm and is considered to be global when the production activities

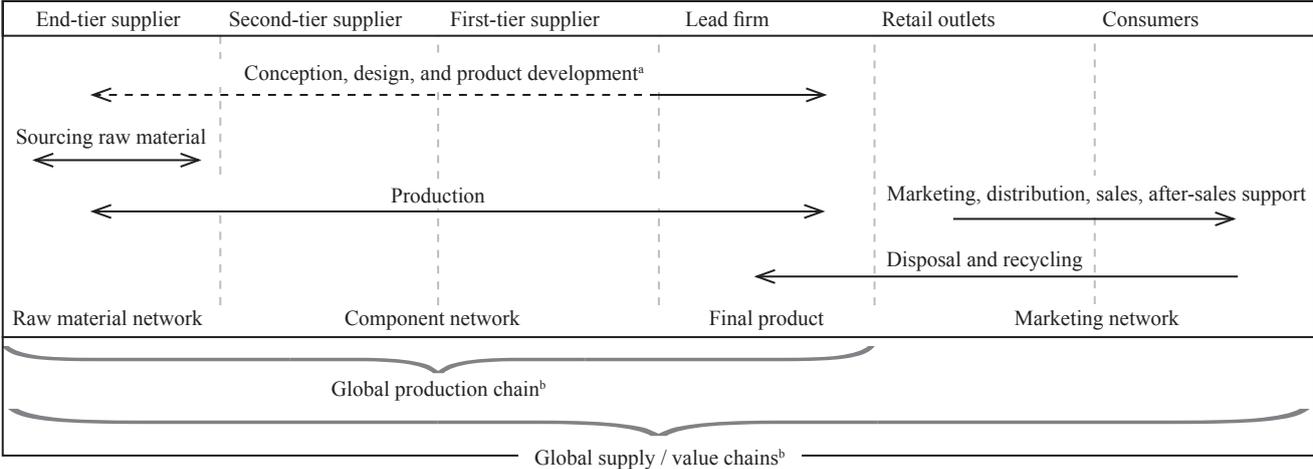
are dispersed across countries (Chang, Bayhaqi, and Yuhua 2012). The relationship between production chains and global value chains is illustrated in Figure 2.1.

Traditionally, product development and at least some transformation activities of the production chain for manufactured products were performed by establishments classified as manufacturers. Over the past two decades, vast improvements in technology, communications, and transportation have allowed firms to share intellectual property and closely control all steps of the transformation process without directly performing any of the transformation steps. This allowed firms to improve profitability by focusing on innovation and product and marketing decisions instead of on the generic services and volume production portions of the value chain, which were then outsourced (Gereffi, Humphrey, and Sturgeon 2005). As a result, some establishments revolutionized their business processes even further and began to perform all of the functions typically associated with manufacturing except for the transformation steps.

These changes have introduced complexities into the production of economic statistics, forcing a reexamination of traditional economic measurement concepts related to industry classification for establishments and to the value of a country's outputs, exports, and imports by both the U.S. and international statistical communities. Economic activity classification systems did not address how to handle the output of establishments that outsourced certain production tasks. In addition, to the extent that production tasks were outsourced internationally, questions were raised concerning how the outsourced activities were handled in national accounts and balance of trade statistics.

This chapter will first look at the response of international statistical organizations to these phenomena and then turn its attention to the U.S. response, highlighting how the latter differed in some aspects from the international response. The chapter will then review implementation planning and issues within the U.S. statistical system.

Figure 2.1 Global Value/Supply/Production Chains



^a Traditionally, conception, design, and product development are controlled by the lead firm; nowadays, however, some of these activities are outsourced to other firms, as is indicated by the dashed line. Arrows on both ends of a line indicate that a process can go in either direction.

^b The players in the global production/supply/value chain include domestic and foreign firms.
 SOURCE: Chang, Bayhaqi, and Yuhua (2012) of the Asia-Pacific Economic Cooperation (APEC) Policy Support Unit.

INTERNATIONAL RESPONSE

The United Nations Statistics Division and the International Monetary Fund (IMF) Statistics Department set standards and produce manuals and guidelines for a number of different international economic statistics. These groups routinely evaluate their standards and make periodic updates in order to stay current as businesses change the way they operate over time. In the past decade, each undertook an extensive multiyear evaluation and update of their processes, at least in part to reflect the impact of globalization. There were some differences in the timing of these efforts, but there was a great deal of collaboration across projects, and each project included widespread outreach to both gather input and obtain comments on drafts.

One of the standards that the United Nations Statistics Division is responsible for is the International Standard Industrial Classification of All Economic Activities (ISIC). As the name implies, this classification is the international standard for the classification of productive economic activities. The main purpose is to provide a standard set of economic activities so that entities can be classified according to the activity they carry out. The United Nations Statistics Division, along with the Technical Subgroup of the Expert Group on International Economic and Social Classifications, began planning a regularly scheduled update of ISIC in 2001. A draft of ISIC Revision 4 was approved in 2006 by the United Nations Statistics Division and released in 2008 (United Nations Statistical Commission 2006).

Clarification of the classification of an establishment that outsources its principle economic activity was one of the many issues addressed in this revision of the ISIC. With respect to outsourcing, it was determined that if any establishment outsources part but not all of its production activities, it should be classified as if it were carrying out the complete process. If an establishment outsources its complete production process, it is also classified as if it were carrying out the complete production process, as long as the output of the production process is not goods. Goods producers that outsource their entire production process are classified as if they were carrying out the complete process only if they are the economic owner of the output. Under these rules, an establishment is the economic owner of an output only if they are the legal

owner of the physical input materials (Becker and Havinga 2007). If an establishment engaged in a goods-producing activity has all the production done by others and does not legally own the material inputs, it is considered to be buying the completed goods from the contractor with the intent to sell them and would usually be classified in the appropriate trade activity (European Commission et al. 2009).²

The System of National Accounts (SNA) is the internationally agreed-upon standard set of recommendations on how to compile measures of economic activity and is produced by the National Accounts section of the United Nations Statistics Division. It describes a coherent, consistent, and integrated set of macroeconomic accounts in the context of a set of internationally agreed-upon concepts, definitions, classifications, and accounting rules. In 2003, the United Nations Statistical Commission identified the need for a comprehensive update of the 1993 System of National Accounts manual based, at least in part, on the impact of globalization.

The main issue related to globalization was the treatment of goods that are sent from one country to another without a change in economic ownership. Under the 1993 SNA, when goods are sent abroad for processing and the processed goods are later returned, a change in ownership is imputed in each case, even when there is none, and the values of imports and exports reflect this imputed ownership change. The 2008 SNA recommended that imports and exports should be recorded on a strict change-of-ownership basis, with imputed changes no longer assumed. Economic ownership is the criterion that is used to determine whether a change in ownership takes place. For establishments involved in goods production activities, the SNA uses the ISIC criteria that an establishment must be the legal owner of input materials for the material used in the production process in order to be considered the economic owner of the output of that process.

According to the 2008 SNA, when goods are transferred from the economic owner in one country to an establishment in another country for further processing and the processed goods are then returned to the economic owner, the goods sent for processing should not be recorded as an export from the economic owner or an import to the processor in national accounts treatment. In addition, the returned processed goods should not be recorded as an export of the processor or as an import to the economic owner. Instead, the fee paid to the processing unit should

be recorded as the import of processing services by the country owning the goods and an export of processing services by the country providing it (European Commission et al. 2009).

The IMF Statistics Department produces standards for concepts, definitions, classifications, and conventions for the compilation of balance of payments and international investment position statistics. As the international standard, its *Balance of Payments Manual* serves as a guide for IMF member countries that regularly report balance of payments data to the IMF. In 2003, the IMF Statistics Department also began working on an update to its *Balance of Payments Manual* in response to changes in the economic and financial environment. The final *Balance of Payments and International Investment Position Manual, Sixth Revision* (BPM6), was adopted in November 2008 (IMF 2009, p. 4).

Because BPM6 (IMF 2009) and SNA2008 (European Commission et al. 2009) were updated simultaneously, BPM6 reflects the same changes in the treatment of goods sent for processing and completed processed goods as described in the national accounts discussion above. BPM6, however, is not entirely consistent with SNA2008 in that it explicitly includes some additional guidelines related to the ownership of materials to be processed and to the location of the buyer of the goods after processing—these are not mentioned in SNA2008. As long as the economic owner of the processed goods is also the economic owner of the material inputs to be processed, that owner may obtain the materials from the owner's economy, the economy of the processor, or a third economy. Additionally, the fee charged by a processor to the owner of a processed good may cover the cost of materials purchased by the processor. When the goods for processing are obtained from a different economy than that of the economic owner, the value of those goods should be recorded as an import to the economic owner. Furthermore, the economic owner of the processed goods does not need to physically take possession of them before ownership is transferred to a buyer. If ownership of the goods is transferred to a buyer in a different economy than that of the economic owner, the sale should be recorded as an export from the economic owner's country (IMF 2009, pp. 161–163).

The International Merchandise Trade Statistics (IMTS), produced by the United Nations Statistics Division, is a set of official statistics that provides data on the movement of goods between countries and serves

many different users with a wide variety of needs. In 2007, the need for a revision of these statistics was recognized because of many factors, including the impacts of globalization and the changes in related statistical frameworks like the *System of National Accounts Manual* and the *Balance of Payments and International Investment Position Manual*. As a result of these efforts, IMTS2010 was adopted in February 2010.

The need for compatibility with SNA2008 and BPM6 was one of the goals of the IMTS revision; however, when the needs of all data users were considered, priority was given to the need for statistics that reflect the physical cross-border movement of goods. As a result, IMTS differs conceptually from BPM6 and SNA2008 with respect to goods for processing and the return of processed goods. Specifically, IMTS recommends that goods for processing be recorded when they enter or leave the economic territory, irrespective of whether a change in ownership takes place. Because of these differences, it was recognized that adjustments to IMTS data would be necessary prior to use in the compilation of other statistics. In order to support the need to make such adjustments, IMTS2010 encourages the identification (preferably by special coding) of goods for processing and goods resulting from such processing in trade statistics. IMTS2010 also encourages the identification and special coding of goods that cross borders as a result of transactions between related parties (United Nations Department of Economic and Social Affairs 2011).

U.S. RESPONSE

The North American Industry Classification System (NAICS) is the standard used by U.S. statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy. It was developed jointly by the U.S. Economic Classification Policy Committee (ECPC 2010),³ Statistics Canada, and Mexico's Instituto Nacional de Estadística y Geografía to allow for a high level of comparability in business statistics among the North American countries, and it was adopted in 1997. NAICS did not explicitly include guidance for the classification of establishments that owned the design and controlled the produc-

tion and sale of goods but outsourced all the production. From 1997 through 2007, the NAICS manual indicated that establishments that were engaged in the mechanical, physical, or chemical transformation of materials, substances, or components into new products should be classified in the manufacturing sector. Furthermore, it suggested that manufacturing establishments may process materials or may contract with other establishments to process their materials for them (OMB 2007, p. 197).⁴ NAICS has historically classified as belonging to the manufacturing sector apparel jobbers who perform entrepreneurial functions involved in other apparel and accessory manufacture; however, the manual did not define exactly what was meant by entrepreneurial functions, nor did it differentiate between establishments that contract out some versus all of the transformation activities (p. 246).

By the late 1990s, individual U.S. statistical programs were beginning to adapt in response to the changes in the economy, but there was no consistent approach—particularly with respect to establishments that perform entrepreneurial functions related to production but don't perform transformation activities. Some programs interpreted the NAICS manual's statement related to contracting with other establishments as applying only to the specifically mentioned apparel jobbers and classified other such establishments in wholesale trade or management of corporations. Others interpreted this statement more broadly but provided their own interpretation of what was meant by "performing entrepreneurial functions." This led to inconsistent NAICS classification decisions across statistical programs for some establishments, making it difficult to draw conclusions when analyzing NAICS data across programs.

In response to these inconsistencies, the ECPC formed the Manufacturing Transformation Outsourcing Subcommittee in July 2008 and charged its members with defining manufacturing transformation outsourcing and identifying characteristics of establishments that outsource manufacturing transformation activities. The team was also responsible for researching international classification efforts and developing classification options for both establishments that outsource transformation activities and those that perform transformation activities for others. The group identified three different types of establishments that could be involved in the production of goods: 1) the traditional integrated manufacturer (IM), 2) the manufacturing service provider (MSP), and

3) the factoryless goods producer (FGP). The characteristics of each type of goods-producing establishment are depicted in Table 2.1.

The team's report also described a wide variety of classification options along with the strengths and weaknesses of each, based on the appropriateness of product valuations and whether the option would support analysis. The team focused on five basic classification options, with variations for some of them. The classification options are described in detail below.

1) Classification in manufacturing

Under the assumption that outsourcing the transformation steps of the manufacturing process is no different than outsourcing other steps, all FGPs could be classified in the manufacturing sector, along with IMs and MSPs. This allows the full value of all goods, including returns to intellectual property, to be included in the manufacturing sector, whether produced by an IM or an FGP.

Within the manufacturing sector, several potential options for classifying establishments were described. All three types of establishments could be included in the appropriate manufacturing industry, with or without breakouts by type of establishment. Breakouts by establishment by type, where possible, would facilitate data analysis of the same types of products but would require the collection of some new data. To the extent that special aggregations excluding FGP activity could be calculated, this option would also allow continuous series to be created in industries with significant amounts of FGP activity. Other possibilities were to create a new manufacturing subsector for all FGPs that would include breakouts for industries that had a significant number of FGP

Table 2.1 Characteristics of Types of Manufacturing Establishments

	Integrated manufacturer	Manufacturing service provider	Factoryless goods producer
Owens intellectual property	Yes	No	Yes
Owens inputs	Yes	May or may not	May or may not
Performs transformation activities	Yes	Yes	No
Owens and sells or transfers finished product	Yes	No	Yes

SOURCE: Author's compilation.

establishments or add six-digit NAICS codes into the current manufacturing structure where warranted. If separate industries were created, it would be important that the new FGP industry product details be collected at the seven-digit product level of the manufacturing numerical list to allow for data analysis. This option would allow for the creation of continuous data series for currently existing manufacturing industries. To the extent that the creation of separate FGP industries might result in unpublishable data, it would not be a very useful distinction for data users.

2) Classification in wholesale trade

All FGP establishments could be classified in the wholesale trade sector, since the composition of labor and capital expenses for FGPs is similar to that in wholesale trade. This classification option would also be consistent with the concept that the primary economic activity of an FGP is the selling aspect of the production process. On the other hand, wholesale trade margin is for the service of goods distribution only. The margin for an FGP would include the value of the services related to design and those related to overseeing transformation in addition to goods distribution. Two possibilities were also considered within the wholesale trade classification option.

In the first possibility, FGP establishments could be classified in the appropriate merchant wholesale industry with or without separate data below that level for own-brand importers, own-brand marketers, and domestic FGPs in addition to the current breakouts for wholesale distributors. Including this additional detail supports calculations and analysis by allowing FGPs to be identified separately from traditional wholesalers; however, data may be unpublishable for some of the breakouts, which would hinder usefulness. It is unlikely that the wholesale trade detail could be expanded to match the current manufacturing detail, making comparisons between FGP and manufacturing data difficult.

A second possibility would be to classify FGP establishments in wholesale trade either in one industry or in three separate industries: 1) own-brand importers (those that arrange transformation by overseas contractor and import and distribute the final good), 2) own-brand marketers (those that arrange transformation by overseas contractor and that drop-ship the output to customers), and 3) domestic FGPs (those that

arrange transformation by domestic contractors). This second possibility supports calculations and analysis by allowing FGPs to be identified separately from traditional wholesalers. The potential benefit of this method is offset by the fact that it is unlikely that the wholesale trade detail could be expanded to match the current manufacturing detail, making comparisons between FGP data and manufacturing data difficult.

3) Split classification between manufacturing and wholesale trade

This option would classify establishments according to whether they outsource overseas in wholesale trade or whether they outsource domestically in manufacturing. This option prevents goods transformed by foreign contractors from being included in domestic manufacturing when it is possible that the only domestic input was the intangible capital owned or leased by a domestic entity; however, it does not handle the situation where both domestic and international contractors are used. The production process for FGPs is exactly the same whether the transformation is contracted out domestically or internationally, so having different classifications based on the location of the contract manufacturer is inconsistent with a NAICS classification system based on production processes. In addition, switches between domestic and foreign contractors would result in classification changes that would lessen the stability of the classification system.

4) Classification in professional, scientific, and technical services

This option would classify FGPs in research and development, since this is the first step in the production process. If research and development is determined to be the primary activity of FGPs, they should be classified in this sector. However, if an FGP acquires the design of the product from another company, no research and design (R&D) activity would be performed at the establishment. Since FGPs are responsible for the sale of products, this option would require an expansion of the definition of this sector to include the selling process, and FGPs would report the value of the good as well as the value of the R&D.

5) Classification in management of companies and enterprises

This option would create a new three-digit industry code (defined as “managing the production process”) within the “Management of

Companies and Enterprises” sector. Input costs for FGPs are probably similar to those associated with other establishments in this sector. If management of production is determined to be the primary activity of FGPs, they should be classified in this sector. On the other hand, this option focuses only on the management of the production process, not on the design or selling of the product. The amount of product detail would be significantly less than would be available in manufacturing, limiting its usefulness for analysis purposes.

ECPC RECOMMENDATION

The ECPC evaluated the report and used it as a basis for a January 2009 Federal Register notice that outlined the issues surrounding offshoring and described some of the available classification options. The ECPC used the Manufacturing Transformation Outsourcing Subcommittee’s paper, the Federal Register responses, and an examination of international classification guidance to aid its members in forming a final classification decision.

The ECPC decided that all factoryless goods producers should be classified in manufacturing with the specific industry classification that is based on the transformation production process used by the contractor. Furthermore, the committee encouraged programs to provide breakouts for IMs, FGPs, and MSPs within each industry to support data analysis needs. The ECPC carefully considered the ISIC4 classification recommendation to base classification solely on legal ownership of material inputs, but it decided that control of the entrepreneurial aspects of the production process, including economic ownership of material inputs, was more appropriate. In doing so, it put forth the following argument:

A strict adherence to the international recommendation to classify FGPs based solely on ownership of materials was considered and rejected as impractical. If the definition of ownership required physical possession, the ability to substitute between input sources in different countries to obtain the lowest cost could change sector classification in NAICS if the inputs were sent directly from the producer in country B to a manufacturing service provider in

country C. The establishment that arranged for the production in country A would never take physical possession of the materials. If the definition of ownership were based on separate transactions, problems would still arise. Contracts between FGPs and their manufacturing partners change with market conditions. Payment terms and the allocation of risk can shift based on variations in the availability of credit and the market power or capacity of the individual parties. Classification of an establishment should not change simply because [that establishment has] the market power to shift the timing of payment for the inputs from the front of the process to the end of the process or because critical shortages of transformation capacity provide outsized negotiating power to a manufacturing service provider. By focusing on the entrepreneurial aspects of the process (and therefore ownership of the goods being produced) rather than ownership of materials, the ECPC eliminates the aforementioned ownership of materials issues. (ECPC 2010)

IMPLEMENTATION PLANNING

Both the U.S. and international statistical communities realized that even after all of the extensive research, outreach, and guideline update efforts had been completed, there was still a significant amount of work to do in order to implement the decisions that had been made and to continue analyzing the best methods to measure national and international transactions in a global economy. In response, implementation groups were formed both internationally and in the United States.

In 2007, the Conference of European Statisticians (CES) created an Expert Group on the Impact of Globalization on National Accounts. Specifically, the goal of this group was to analyze the impact of the updated guidelines on existing statistical measures, with a particular focus on national accounts, and to identify and propose solutions for problem areas. The group completed an extensive review of the topic and produced a detailed guide, “The Impact of Globalization on National Accounts,” which was finalized in June 2011 (United Nations Economic Commission for Europe 2011). The guide documented a wide variety of issues and offered solutions to many problems; however, the authors recognized that there was still a need for additional research

and included a chapter at the end outlining work still to be done. As a follow-up to this effort, the CES requested that Statistics Netherlands elaborate on the remaining issues, and this work resulted in the paper “In-Depth Review on Global Manufacturing” (Statistics Netherlands 2011). It also led to the formation by the CES of a Task Force on Global Production, which is responsible for developing guidance on unresolved issues related to SNA2008 and BPM6 and on aspects related to implementing these standards.

In early 2012, this Task Force on Global Production developed and prioritized a list of conceptual and measurement issues that needed to be addressed. In October 2012, the task force prepared an interim report that focused on the top-priority issues and presented a draft report on all issues to the Group of Experts on National Accounts in April 2012. The task force received feedback from the Group of Experts on National Accounts that there was a need for more emphasis on specific guidance and practicality, so the output will be finalized in the form of a practical guide to be used in the preparation of statistics on global-production-related activities (ECE 2013). The task force also produced a report on factoryless goods production that questioned whether ownership of material inputs is an appropriate criterion for classifying an FGP in manufacturing (Task Force on Global Production 2013). That report was presented to the Expert Group on International Statistical Classifications in May 2013.

In the United States, the ECPC recognized that the NAICS classification decisions the committee adopted would affect multiple U.S. agencies, as well as programs within those agencies. Furthermore, the ECPC realized that, as with any new concept, there would likely be some differences in interpretation across agencies during the implementation process, and that these differences might lead to data inconsistencies. As a result, the ECPC sponsored a multiagency task force to ensure consistent implementation of the inclusion of FGPs in the manufacturing sector in the 2012 NAICS. The team is composed of representatives from the Bureau of Economic Analysis (BEA), the Bureau of Labor Statistics (BLS), the Census Bureau, the Federal Reserve, and the International Trade Commission.

The FGP Implementation Planning Group began meeting in late June 2010, with the goal of defining a set of rules that agencies could use to implement the ECPC recommendation for classification of FGPs

in the 2012 NAICS. The group's analysis of the issues relating to implementation of this concept indicated that these changes must first be implemented in conjunction with a quinquennial economic census in order to survey establishments in the appropriate sector. Given the complexity of the changes and the timing within the planning for the 2012 Economic Census, the group determined that it did not seem feasible to implement in 2012. The team considered partial or sequential implementation on a pilot basis by applying the new rules to only some establishments or industries or by applying only some of the rules, but it determined that this approach would be problematic since it would result in multiple series breaks over time, especially at aggregate levels. As a result, the planning group recommended that full implementation of the outsourcing redefinitions should be delayed, the new goal being to implement them for the 2017 Economic Census.

This recommendation was accepted by the ECPC and the OMB in November 2010. Implementation was deferred, and the interagency group was asked by the ECPC to continue the work of coordinating the implementation of this change. Then, in a further delay, the OMB announced in August 2014 that it was rescinding its earlier decision requiring that statistical agencies implement the classification change of assigning FGPs to the manufacturing sector by 2017, because the agencies "need an opportunity to perform additional research, testing, and evaluation." The remainder of this chapter will discuss the work of the FGP Implementation Planning Group.

U.S. IMPLEMENTATION ISSUES

Internationally, the concept of economic ownership was integral to many of the decisions made relating to the handling of transactions. The ECPC decision to classify FGPs in manufacturing did not explicitly mention the concept of economic ownership, but it did focus on control of the entrepreneurial aspects of production, which is in essence the acceptance of the risks and rewards of the production process. To be the economic owner of a product, an establishment must control the intellectual property (IP) or design, control the production process, control the sale of the product and assume entrepreneurial risk. A more detailed

description of each of those four criteria, however, is required for an in-depth understanding of the concept.

Control of the IP or design means that the establishment either has developed it internally, has purchased it from another firm, or has negotiated to lease it from another firm. For a domestic establishment with a foreign affiliate, it is possible that the U.S. establishment could be leasing the IP or design from its affiliate. It is also possible that it could be leased to more than one economic owner. From a business-function standpoint, an establishment is the economic owner of the IP or design if it has the right to use it in its products, redistribute it, and can independently change the design of the final product.

There are many aspects to controlling the production process, including controlling inputs, product quality, and production levels. With respect to inputs, the economic owner can control inputs for the final product in a number of different ways. The owner could purchase the inputs and ship them to the MSP, arrange to have them shipped to the MSP from another domestic or foreign location, or merely approve the selection of input providers and the quality of the inputs. The economic owner also makes decisions about which products to produce and controls production levels and product quality. An economic owner can decide whether to add or delete product lines, expand his or her business, move into a different business, or leave the business entirely. Finally, the economic owner must also be able to report the cost of manufacturing service.

The economic owner of a product arranges to sell (or transfer in the case of an affiliate) the product to buyers (consumers, government, wholesalers, retailers, or other types of businesses, including manufacturers) and sets the price associated with the transaction. The economic owner does not need to take physical possession of the product or arrange the details of shipments to purchasers, but the owner must be able to report the value of those shipments.

There are a number of indicators that an establishment has taken on the entrepreneurial risk related to a product. The economic owner absorbs the loss for any unsold final products. It is also responsible for losses due to final products that fail to meet the customer's satisfaction, for which an unsatisfied customer would return the product to the economic owner (or a representative of the economic owner) for a refund, rather than to the establishment that performed the transformation.

Finally, it is legally responsible for legal problems related to defects or other problems in the final product.

The criteria for determining economic ownership apply in the same way whether the relationship is between a U.S. establishment and a foreign establishment that performs transformation activities or between a foreign establishment and a U.S. establishment performing transformation activities.

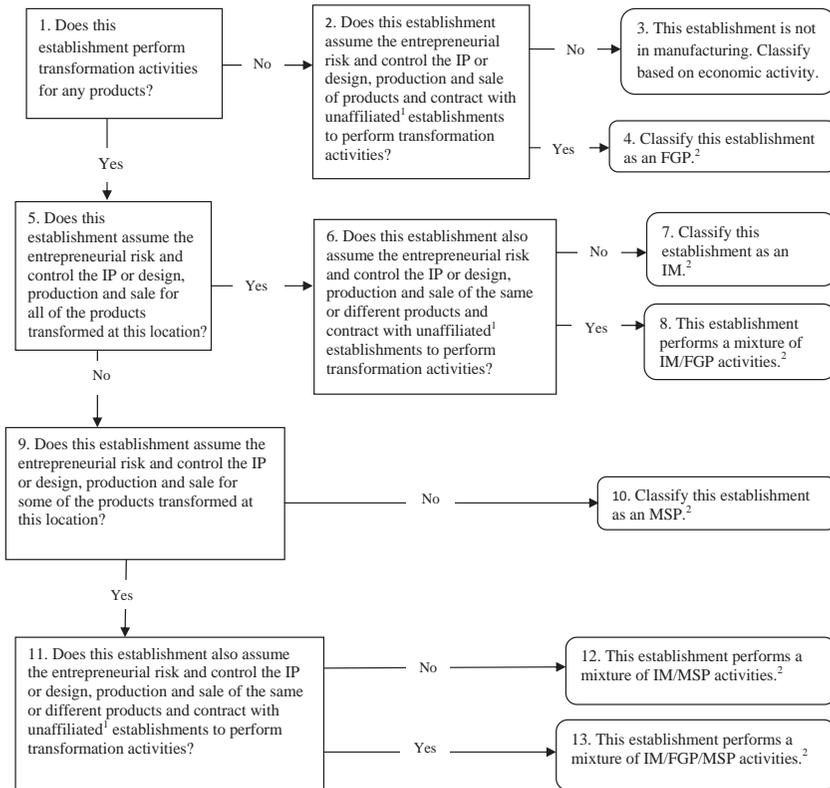
Defining Decision Rules

The FGP Implementation Planning Group determined that the best way to ensure a consistent understanding of how the classification decision-making process that is related to outsourcing should be implemented was to consider various scenarios and determine the appropriate classification for each. Based on these discussions of potential scenarios, the team reached conceptual agreement on classification outcomes and created an outsourcing decision tree that reflected the implementation of those concepts. In creating the scenarios, it became clear that a single establishment might perform both integrated manufacturing and manufacturing service-providing activities and at the same time have a factoryless goods production relationship with an unaffiliated transforming establishment. As a result, those possibilities are found in the decision tree. The decision tree reflects what the team considered would be the “ideal” implementation from a conceptual standpoint and is displayed in Figure 2.2.

There may be practical difficulties in implementing this ideal scenario because of external factors such as the differences between international and U.S. recommendations or issues reporting establishments might have in providing the information required to support classification decision making. There could also be internal limitations to implementation procedures related to the availability of resources within statistical agencies.

Several different agencies or programs currently make independent classification decisions for establishments. As long as a potential FGP and an MSP don't belong to the same enterprise, decision making using the decision tree is fairly straightforward and would routinely result in consistent decision making across agencies and programs. Multi-

Figure 2.2 Outsourcing Decision Tree—Ideal Definitions



¹ All foreign establishments should be treated as unaffiliated.

² If an establishment performs a mixture of integrated manufacturer (IM), manufacturing service provider (MSP), and factoryless goods producer (FGP) activities, it should be classified into one of the three unique subindustries, IM, MSP, or FGP, based on where most of its activity occurs.

SOURCE: Author’s compilation.

establishment enterprises in manufacturing industries generally include establishments that perform transformation activities and establishments that control or provide support to the production activities. When all of the establishments of an enterprise are in the United States, the decision-making process is still fairly straightforward, since an establishment can only have FGP activity if it assumes the entrepreneurial risk and controls the IP or design, the production, and the sale of

products, and if it contracts with *unaffiliated* establishments to perform transformation activities.

The ideal definitions, however, specify that all foreign establishments should be treated as unaffiliated. Thus, there is a potential FGP/MSP relationship whenever a product is transformed by a foreign affiliate. In recent years, multinational enterprises (MNEs) have responded to improved communications and a need to manage global operations by unbundling management functions in the same way they have unbundled production functions. Global enterprises may spread typical headquarters functions across locations, even in different countries, based on local regulations and proximity to labor sources, customers, and suppliers. This can result in different locations for the financial, legal, and decision-making functions of an enterprise (Desai 2009). As a result, assigning economic ownership to a specific establishment is particularly difficult when analyzing the relationship between headquarters-type and transforming-type establishments of the enterprise. Within an enterprise, an establishment that doesn't perform transformation may meet all the criteria for economic ownership of a product, but the transaction may be recorded on another establishment's books for reasons such as tax purposes. In addition, it is possible that some of the decision-making tasks that are included in the economic ownership criteria may be split across more than one headquarters-type establishment.

The U.S. interagency group has expressed concern that the complexity of classification decisions when MNEs are involved will result in an inefficient allocation of resources if each agency or program works independently to resolve these issues, and that will make it difficult for agencies or programs to make consistent decisions about the establishments of individual enterprises, as well as to make consistent decisions across enterprises. Some of the countries in the European Union (EU) have begun to form groups to work together to ensure that the transactions of MNEs are treated consistently across national accounts and national economic statistics. The U.S. interagency group has proposed a similar approach as part of the plan for the implementation of the FGP concept, with the formation of a standing cross-agency group to make classification recommendations for the major multinational enterprises that operate in the United States. The Census Bureau, the BEA, and the BLS each collect a different set of detailed statistical data from enter-

prises and establishments. Analysis of the combination of those data would likely result in the best decisions related to the classification of the establishments of these enterprises and the amount of revenue that should be attributed to each. Given the organization of U.S. statistical programs, the formation of such a group would require new data-sharing agreements and potentially new funding sources, and thus this proposal might be very difficult to implement. In the meantime, efforts to develop other approaches for handling these challenges will continue.

Understanding Data Needs

There are many data interdependencies among U.S. statistical agencies and the programs within them. In order to successfully implement the manufacturing redefinition clarification, statistical agencies have some special needs related to the data inputs that they receive from one another so they can accurately calculate statistics that reflect the inclusion of factoryless goods manufacturers in manufacturing.

Integrated manufacturers, manufacturing service providers, and factoryless goods producers each have a different mix of inputs and operating constraints. As a result, it may be necessary to produce separate data for each type of operation in many statistical series, either as unpublished components of published aggregate data or as published series. In order to support these data analysis needs, statistical programs will need values for inputs and outputs broken out by type of operation.

Some statistical agencies use the customs data provided by the IMTS in the production of statistics related to imports and exports. Since IMTS2010 gave priority to the need for statistics that reflect physical border-crossing of goods, customs data provided by the IMTS differ conceptually from the ECPC definition of FGP with respect to goods for processing and the return of processed goods. In order to use customs data in compiling other statistics that follow the ECPC definition, data will need to be obtained from other sources to adjust customs data to reflect the ECPC concept.

It is important both to statistical agencies and to other data users to be able to distinguish between definitional and economic changes so that these users of the data can create continuous time series and analyze data changes over time. As a result, individual statistical programs

will need access to conversion, or bridge data, for various data series in order to produce historically consistent time series.

Statistical agencies rely on businesses to provide the data required to calculate economic statistics. For this reason, the interagency group also recognized the importance of understanding the types of data that establishments involved in outsourcing would likely be able to supply. In order to obtain this information, the group met with associations and companies and analyzed publicly available company data (particularly Form 10-Ks) to determine how companies manage and record their outsourcing activities. Another method used to determine data availability was the inclusion of “special inquiry” questions on current survey forms for some statistical programs. These questions serve the dual purpose of testing potential questions and identifying establishments that would likely be classified as FGPs when the manufacturing redefinition is implemented. The results of this research will be used as input to the creation of updated data collection instruments.

EXPECTED IMPACT ON ECONOMIC STATISTICS

The classification of factoryless goods producers in manufacturing is expected to have an impact on a number of different statistical programs, some of which are listed below:

- **U.S. Census Bureau**—Economic Census, annual and monthly wholesale trade surveys, Annual Survey of Manufacturers, several other NAICS-based series.
- **Bureau of Economic Analysis**—industry accounts, international accounts, National Income and Product Accounts, regional accounts.
- **Bureau of Labor Statistics**—Current Employment Statistics program, Quarterly Census of Employment and Wages, Producer Price Index program, International Price Program, Major Sector Productivity program, and Industry Productivity program.
- **Federal Reserve**—industrial production.

General Expectations by Type of Measure

The exact impact of these changes will depend on the classification decisions that are made for individual establishments when the new rules are applied, as well as on the size of those establishments at the time the rules take effect, whenever that may be. As a result, there is currently not enough information to quantify the exact impact, and there won't be until that information becomes available. We do have enough information, however, to describe the types of changes that are expected for a number of different economic measures. These expectations are described in Table 2.2.

Impact on Specific Manufacturing Industries

Although exact impact measures cannot currently be calculated, existing data can be analyzed in an attempt to identify which industries are most likely to be affected by these changes and to make some estimates related to the size of some of the changes. The data expectations described above indicate that changes within manufacturing will be centered on specific industries. For planning purposes, it would be helpful to economic programs to identify which industries will likely be most affected by the inclusion of FGPs in manufacturing in order to support any required decision making.

In order to develop measurement statistics, I make the following four assumptions related to manufacturing industries:

- 1) Manufacturing industries that currently purchase a relatively large amount of contract work have a production process that is consistent with the outsourcing of transformation tasks.
- 2) Under current procedures, if a manufacturing establishment outsources all of the transformation for its products, the sales of those products are coded as resales. Therefore, manufacturing industries with relatively high levels of resales are likely to have FGP activity under the new rules.
- 3) The ratio of production employees to total employees will be lower for manufacturing industries that outsource transformation activities.
- 4) Manufacturing industries with relatively high levels of imports for their products are likely to be involved in outsourcing.

Based on these assumptions, data from the 2007 Economic Census and the 2002 benchmark I-O tables were examined to find measures that might help identify industries that currently have characteristics that could be indicative of FGP activity. No single measure was identified that could reflect the criteria in all four assumptions. As a result, five different measures were identified, and analysis focused on the full set of measures rather than on any individual measure. For each measure, values were calculated for each six-digit NAICS manufacturing industry along with weighted average values for all manufacturing industries. For most of the measures, values higher than the average were considered indicative of potential FGP activity. For the number of production workers divided by total employment, values lower than the averages were considered indicative of potential FGP activity. In order to further support analysis, a level was judgmentally selected for each measure to indicate a value that was significantly higher or lower than the average, so that about half of the above- or below-average industries were considered to be significantly above or below. The formulas for each measure are displayed in Table 2.3, along with the percentage level significantly above or below.

The goal of the analysis was two-pronged. At a high level, the goal was to provide a big picture of the impact of this change on the manufacturing sector. At an industry level, the goal was to provide early support for agency planning processes by systematically identifying those specific industries that are most likely to be affected by the inclusion of FGPs in manufacturing and thus may need special processing. Industries were assigned to one of three categories based on the number of measures above average and significantly above average (or, as noted earlier, below average, in the case of number of production employees divided by total employment). Although the five measures were selected because of their expected relationship to potential FGP activity, the level of each of the measures for a particular industry could be affected by other factors as well. As a result, criteria were set for the three categories, assuming that an industry with fewer than five measures above average could have a high likelihood of being affected by the inclusion of FGPs in manufacturing, while those industries with only one measure above average would be unlikely to be affected. Table 2.4 displays the exact criteria that were used to assign industries to categories, as well as statistics for each of the three categories.

Table 2.2 Expected Changes to Economic Measures

Measure	Expected change
Total U.S. employment and wages	U.S. totals will not change.
Sector U.S. employment and wages	Values will shift across sectors, with manufacturing growing and other sectors, primarily wholesale trade, shrinking. Increases in manufacturing are expected to be centered on specific industries. This will result in regional shifts within sectors, including manufacturing.
Production employees	U.S. totals will not change. Sector total changes will be minimal, since FGPs would have few, if any, production employees.
Total U.S. revenue values	<p>The total will likely change, but the direction and amount of the change are unknown.</p> <ol style="list-style-type: none"> 1. FGPs may report revenues from products that would have previously been treated as imports. 2. For an FGP manufacturing establishment previously classified in wholesale trade, revenues will increase by the difference between the wholesale trade margin and the full value of the products for some statistical measures. 3. For manufacturing establishments that are determined to be MSPs rather than IMs, revenues will decrease by the difference between the full value of the product and the value of the manufacturing service they provided.
Sector U.S. revenue values	Sector totals will change, with increases expected in manufacturing and decreases in other sectors. The manufacturing changes will likely be in specific industries.
Value of U.S. imports	<p>The total will likely change, but the direction and amount of the change are unknown. The mix between goods and services will also change. The changes will be centered in specific product areas.</p> <p>For products transformed by foreign MSPs for domestic FGPs:</p> <ol style="list-style-type: none"> 1. The full value of the products that the foreign MSPs transformed and returned to the U.S. FGPs will be excluded from imports.

2. The value of the manufacturing service that they performed and any inputs they provided will be included in imports.

For products transformed by U.S. MSPs for foreign FGPs:

1. The full value of the products that they transformed that remain in the U.S. are included in imports.
2. The value of any inputs that they received from the foreign FGP will be excluded from imports.

Value of U.S. exports

The total will likely change, but the direction and amount of the change are unknown. The mix between goods and services will also change. The changes will be centered on specific product areas.

For products transformed by foreign MSPs for domestic FGPs:

1. The value of products that have remained in a foreign MSP's country or that were shipped by a foreign MSP to another country will be added to exports.
2. The value of the inputs that the domestic FGP provided to the MSP will be excluded from exports.

For products transformed by U.S. MSPs for foreign FGPs:

1. The full value of any product that they transformed and returned to the foreign FGP will be excluded from exports.
2. The value of the manufacturing service that they performed and any inputs they provided will be included in exports.

SOURCE: Author's compilation.

Table 2.3 Industry Impact Analysis Measures

Measure	Average for all manufacturing industries (%)	Significantly above/below average level (%)
2007 Economic Census		
(Cost of contract work) / (payroll)	9.7	15
(Cost of contract work) / (cost of materials and parts)	5.9	10
(Cost of resales) / (total cost of materials)	2.3	5
(Number of production workers) / (total employment)	70.1	60
2002 benchmark I-O tables		
(Imports) / (domestic production + imports – exports)	23.2	30

SOURCE: 2007 Economic Census and 2002 benchmark input-output (I-O) tables.

In order to summarize the industry results, the industry categorization was further analyzed by aggregating the industries by subsector and calculating the percentage of each subsector's value of shipments (VOS) that is attributable to industries in each of the three categories. These percentages are displayed in the Table 2.5, along with a count of the number of industries in the category. The analysis indicates that the apparel manufacturing and computer and electronic product manufacturing subsectors had the highest portion of their VOS from industries in the highest-likelihood category. This is consistent with the generally accepted assumption that these two subsectors will be strongly affected by the manufacturing redefinition.

Analysis of Wholesale Trade for Own-Brand Importer-Marketers

The wholesale trade survey forms for the Economic Census include a question related to the type of operation. One of the operation types is, "own-brand importer-marketer." Own-brand importers-marketers deal primarily or exclusively in the parent company's own branded products manufactured outside the United States. The products are either imported into the United States and then sold, or they are sold and then drop-shipped directly from a foreign location to the U.S. customer. It is expected that many of the wholesale trade establishments categorized

Table 2.4 Results of Manufacturing Industry Impact Analysis

Category	Criteria	Number of industries	% of total manufacturing establishments	% of total manufacturing employment	% of total manufacturing VOS
Highest likelihood	4 or 5 measures above average, or 3 above average with more than one significantly above average	150	33	30	25
Medium likelihood	3 measures above average with fewer than 2 significantly above, or 2 above average	160	40	34	39
Lowest likelihood	0 or 1 measure above average	161	27	36	36

NOTE: "VOS" stands for value of shipments.

SOURCE: Author's calculations based on 2007 Economic Census and 2002 benchmark input-output (I-O) tables.

in this operation type will be classified in manufacturing using the new classification rules. In the 2007 Economic Census, about 3 percent of all wholesale trade establishments were own brand importer-marketers.⁵ Those establishments accounted for about 4 percent of wholesale trade sales and employment. If all those establishments had been classified in manufacturing, the number of manufacturing establishments would have increased by about 3 percent, sales would have increased by about 4 percent, and employment would have increased by about 2 percent. The wholesale trade industry groups that have the largest proportion of their sales from own-brand importer-marketers are officially known as "Apparel, piece goods, and notions merchant wholesalers" and "Electrical and electronic goods merchant wholesalers."

Table 2.5 Analysis of the Impact of Inclusion of FGPs in Manufacturing by NAICS Subsector

Sector	Title	% of subsector VOS from industries by likelihood of impact			No. of subsector industries by likelihood of impact		
		High	Medium	Unlikely	High	Medium	Unlikely
311	Food manufacturing	3.0	20.0	76.9	2	8	37
312	Beverage and tobacco product manufacturing	0.0	52.1	47.9	0	5	4
313	Textile mills	25.2	41.7	33.1	4	4	4
314	Textile product mills	47.9	48.4	3.7	5	2	1
315	Apparel manufacturing	86.8	11.7	1.5	17	5	2
316	Leather and allied product manufacturing	43.6	56.4	0.0	5	4	0
321	Wood product manufacturing	4.1	8.3	87.6	1	2	11
322	Paper manufacturing	0.5	5.5	94.0	1	3	16
323	Printing and related support activities	21.1	65.7	13.2	4	5	3
324	Petroleum and coal product manufacturing	0.0	96.2	3.8	0	2	3
325	Chemical manufacturing	30.7	48.8	20.5	4	19	11
326	Plastics and rubber product manufacturing	0.0	13.3	86.7	0	4	13
327	Nonmetallic mineral product manufacturing	17.3	28.0	54.6	7	10	7
331	Primary metal manufacturing	40.6	24.2	35.2	2	11	13
332	Fabricated metal product manufacturing	33.1	51.4	15.5	17	19	7
333	Machinery manufacturing	46.9	38.6	14.5	27	17	5
334	Computer and electronic product manufacturing	77.4	20.3	2.3	21	7	2
335	Electrical equipment, appliance, and component manufacturing	25.1	35.9	39.0	5	9	8
336	Transportation equipment manufacturing	23.3	22.2	54.5	5	12	13
337	Furniture and related product manufacturing	17.0	35.6	47.4	4	5	4
339	Miscellaneous manufacturing	75.6	23.9	0.5	14	8	1

NOTE: "VOS" stands for value of shipments.

SOURCE: Author's calculations based on 2007 Economic Census and 2002 benchmark input-output (I-O) tables.

IMPORTANCE OF CHANGES FOR DATA USERS

Over the past 20 years, U.S. economic statistical programs recognized that there have been major changes in the way businesses operate, particularly with respect to production fragmentation and globalization, but individual agencies and programs in those agencies made different methodological decisions in response to those changes. There was not an integrated comprehensive examination of how these economic changes should be reflected in the entire set of economic statistics.

Business and governmental decision makers use a wide variety of U.S. economic statistics from different agencies and programs on a daily basis. To the extent that these statistics are inconsistent with one another or have not kept pace with changes in the economy, they may make it difficult for data users to make sound decisions. This problem has been recognized by both government and business data users and has been characterized as “using a 1950s dashboard to operate a 21st-century machine” (Karabell 2013, p. G1).

The collaborative effort of U.S. statistical agencies to reach agreement on how to identify and handle factoryless goods producers and manufacturing service providers will result in more data consistency across agencies. In addition, it will allow statistical agencies to provide data about the three different types of manufacturing establishments, at least at an aggregate level, allowing data users to see changes over time and to analyze differences across the three types of establishments. These benefits will support the need of business and government leaders to make informed decisions.

Notes

1. All views expressed in this chapter are those of the author and do not necessarily reflect the views or policies of the U.S. Bureau of Labor Statistics.
2. For a detailed description of the usual classification rules, refer to United Nations Department of Economic and Social Affairs (2008).
3. More information about the ECPC can be found at <http://www.census.gov/eos/www/naics/ecpc/ecpc.html> (accessed November 12, 2013).
4. The following link includes links to various sectors of the manual: <http://www.census.gov/cgi-bin/sssd/naics/naicsrch?chart=2007> (accessed April 21, 2014).

5. Detailed data on wholesale trade by type of operation can be found at U.S. Census Bureau (2007).

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Volume 2

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