

## REFLECTING FACTORYLESS GOODS PRODUCTION IN THE U.S. STATISTICAL SYSTEM

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### **BACKGROUND**

The goal of a country's national statistical agencies is to provide relevant, timely, and accurate information on the country's economy. 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 over the past twenty 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.<sup>1</sup>

The economic activities of a value chain can be performed by one or more establishments of a single firm or can involve many different firms. Some typical steps in a value chain are listed below.

- Select products to produce
- Identify markets and customers
- *Create or purchase design/ Intellectual Property*
- *Identify a production process*
- *Determine production levels*
- *Determine input needs – amount, quality types*
- *Identify and select input suppliers*
- *Perform transformation steps*
- Set prices
- Create a marketing plan
- Document sales agreements with customers
- Distribute product to customers
- Address customer issue with products

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. In the value chain list of steps above, production chain activities

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<sup>1</sup> Global value chains – Concepts and Tools, Global Value Chains Initiative, <http://globalvaluechains.org>

are denoted in italics. A production chain is typically controlled by a lead firm and is considered to be global when the production activities are dispersed across countries.<sup>2</sup>

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.<sup>3</sup> As a result, some establishments revolutionized their business process even further and began to perform all the functions typically associated with manufacturing except for the transformation steps.

These changes have introduced complexities into the production of economic statistics, forcing a re-examination of traditional economic measurement concepts related to industry classification for establishments and the value of a country's outputs, exports, and imports both within the U.S. and internationally. 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 accounts were handled in National Accounts and Balance of Trade statistics. Both the international and U.S. statistical communities recognized the need to re-examine their policies in response to these events.

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

## **INTERNATIONAL RESPONSE**

There are number of different international statistical organizations that produce documentation and procedures related to economic statistics that were potentially impacted by globalization. In the past decade, each undertook an extensive evaluation and update of their processes. These efforts and the conclusions that were reached are described below.

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<sup>2</sup> "Concepts and Trends in Global Supply, Global Value and Global Production Chains" Issues paper No.1, APEC Policy Support Unit, May 2012.

<sup>3</sup> Gereffi, Gary, "The Governance of Global Value Chains," *Review of International Political Economy* 12:1 February 2005:pp.78-104.

Organization	Document
United Nations Statistics Division	International Standard Industrial Classification of All Economic Activities (ISIC)
United Nations Statistical Commission	System of National Accounts (SNA)
IMF Statistics Department	Balance of Payments Manual (BPM)
UN Statistics Division	International Merchandise Trade Statistics

## 1. International Standard Industrial Classification of All Economic Activities (ISIC)

The United Nations Statistics Division along with the Technical Subgroup of the Expert Group on International on Economic and Social Classifications began planning a regularly scheduled update of the International Standard Industrial Classification of All Economic Activities (ISIC) in 2001. The group developed questionnaires, a concept paper, and discussion papers to use as tools for obtaining input from about 60 countries. It was recognized that the issues being worked for ISIC were also relevant for the SNA, which was also being updated. As a result, there was collaboration between the groups to the extent possible given that the ISIC revision was scheduled to be finalized prior to the completion of the SNA update. A first complete draft of ISIC, Revision 4 was produced, including the full detailed structure and explanatory notes for the revised classification, and distributed to the national statistical offices of all countries and interested international agencies in May 2004. A draft of ISIC Revision 4 was approved in 2006 by the UN Statistical Division and released in 2008.<sup>4</sup>

Clarification of the classification of an establishment that outsources its principle economic activity was one of the many issues addressed in this ISIC Rev. 4. In April 2007, the Technical Subgroup of the Expert Group was asked to determine how to classify an establishment that outsourced some or all of their economic activity. The group was instructed to identify a set of criteria that were distinct, observable, and consistent with the principles of the System of National Accounts and the Balance of Payments Manual. In the process of identifying criteria, they considered three options:

1. Ownership of the physical input materials
2. Ownership of the intellectual property or design
3. Ownership of both the physical input materials and the intellectual property or design.

They ultimately decided that an establishment could not be the economic owner of an output if they were not the legal owner of at least some the physical input materials should be the sole criteria used for classification and created the following classification rules:<sup>5</sup>

- If an establishment outsources support functions, it should be classified based on its core production process, since the support functions do not lead to the production of the final good

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<sup>4</sup> Report of the Secretary General on International and Social Classification, UN Economic and Social Council, Statistical Commission 37<sup>th</sup> session, 7-10 March 2006, <http://unstats.un.org/unsd/statcom/doc06/2006-7e-Classifications.pdf>

<sup>5</sup> Becker Ralf and Havinga, Ivo, "Treatment of Outsourcing in International Standard Industrial Classification (ISIC)," Rev. 4, Notes for OECD Structural Business Statistics Expert Meeting – Paris, pp. 10-11 May 2007.

or service. The contractor in this case should be classified based on the specific support function it carried out.

- If an establishment outsources a part of its production process of a good or service but not the whole process, it is considered to own the physical input materials and thus the final outputs and should be classified as if it were carrying out the entire production process. The contractor should be classified according to the portion of the production process it undertook.
- If an establishment engaged in a service-producing activity, including construction, sub-contracts out all the service activities, both the contractor and the establishment that contracted out the activities are classified as if they were carrying out the complete service activity.
- If an establishment engaged in a goods-producing activity has all the production done by others and owns the materials inputs, it is also considered to be the economic owner of the outputs and should be classified in manufacturing activity that corresponds to the complete manufacturing activity. The contractor should be classified based on the manufacturing activity it performed.
- If an establishment engaged in a goods-producing activity has all the production done by others and does not own the materials inputs, it is considered to be buying the completed goods from the contractor with the intent to sell it. It would usually be classified in the appropriate trade activity but, if it performs other functions such as research and development, the usual rules for identifying the principal activities would apply.<sup>6</sup> The contractor should be classified based on the manufacturing activity it performed.

## **2. System of National Accounts (SNA)**

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 work on this project was coordinated by the Intersecretariat Working Group on National Accounts (ISWGNA) and the Advisory Expert Group on National Accounts composed of 20 experts from around the world that was charged with the responsibility for considering proposals for changes, expressing its views and making recommendations. The group met four times between 2004 and 2006 and made recommendations on 44 issues. After each meeting, recommendations were sent to national statistical offices and interested central banks. As a result of this outreach, comments on draft recommendations were received from almost 100 countries.<sup>7</sup>

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

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<sup>6</sup> For a detailed description of the usual classification rules refer to UN Department of Economic and Social Affairs Statistics Division, International Standard Industrial Classification of All Economic Activities (ISIC), Rev.4, United Nations, NY May 2008.

<sup>7</sup> Report of the Intersecretariat Working Group on National Accounts, UN Economic and Social Council, Statistical Commission 38<sup>th</sup> session, 27 February - 2 March 2007.

for processing and the processed goods are later returned, a change in ownership is imputed in each case, even when there is none, with values of imports and exports reflecting 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 if a change in ownership takes place. A change in economic ownership means that all risks, rewards, and rights and responsibilities of ownership in practice are transferred from one establishment to another. 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 good is 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. The same treatment is recommended for recording the goods of one establishment sent for processing to another establishment of the same enterprise within the same economy when the receiving establishment does not take on responsibility for the consequences of the continuation of the production process. In such a case, the only output of the establishment receiving the goods is providing the processing services.<sup>8</sup> In theory, this will result in the same overall balance of trade as would have been calculated under SNA 1993; however, there would be shifts between the goods and services sectors.

### **3. IMF Balance of Payments Manual**

In 2003, the IMF's Statistics Department also began working on an update to its Balance of Payments Manual in response to changes in the economic and financial environment. An Annotated Outline of the new manual was prepared identifying proposed content, issues to be resolved, and proposed solutions. A significant effort was made to solicit input from technical experts including the IMF Committee on Balance of Payments Statistics via a series of issue and position papers and discussions. They also worked closely with the ISWGNA to ensure coordination with the SNA efforts to promote consistency between the two documents. A draft manual was produced in December 2006 and was followed by another round of discussion and reviews. A second draft was produced in March 2008 and was followed by extensive outreach efforts to explain the changes and obtain feedback. The final Balance of Payments and International Investment Position Manual, Revision 6 (BPM6) was adopted in November 2008.<sup>9</sup>

Because BPM6 and SNA 2008 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

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<sup>8</sup> System of National Accounts, Annex 3, p.595.

<sup>9</sup> International Monetary Fund (2009) Balance of Payments and International Investment Position Manual (BPM6), IMF (Washington D.C.) Introduction, p. 4.

Accounts discussion above. BPM6, however, is not entirely consistent with SNA 2008 in that it explicitly includes some additional guidelines related to the ownership of materials to be processed and to 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, they may obtain the materials from their economy as the owner, 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.<sup>10</sup>

#### **4. International Merchandise Trade Statistics<sup>11</sup>**

The IMTS are a set of official statistics that provide data on the movement of goods between countries and serve the needs of many different users with a wide variety of needs. These statistics are produced by the UN Statistics Division with the support of the IMTS Task Force composed of specialists in International Merchandise Trade Statistics from Eurostat, the Food and Agriculture Organization, the International Monetary Fund, the Organisation for Economic Co-operation and Development, the United Nations Statistics Division, the UN Conference on Trade and Development, and the UN Regional Commissions. In 2007, the need for a revision of these statistics was recognized due to many factors including the impacts of globalization and the changes in related statistical frameworks including the System of National Accounts and Balance of Payments. Areas where revision was particularly needed and a set of issues for which advice was needed were identified, and extensive worldwide consultation involving over 100 countries including the U.S. was undertaken during 2008 and 2009. As a result of these efforts, IMTS 2010 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. The Task Force 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.

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<sup>10</sup> Ibid, Chapter 10, pp. 161-163.

<sup>11</sup> UN Department of Economic and Social Affairs, International Merchandise Trade Statistics: Concepts and Definitions 2010, United Nations, New York 2011.

## **U.S. RESPONSE**

The North American Industry Classification System (NAICS) is the standard used by Federal 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)<sup>12</sup>, 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 was adopted in 1997. NAICS did not explicitly include guidance for the classification of establishments that owned the design and controlled the production 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 manufacturing establishments may process materials or may contract with other establishments to process their materials for them.<sup>13</sup> NAICS has historically classified apparel jobbers who perform entrepreneurial functions involved in other apparel and accessory manufacture in the manufacturing sector<sup>14</sup>; however, the manual did not define exactly what was meant by entrepreneurial functions nor did it differentiate between establishments that contract some versus all of the transformation activities.

By the late 1990's, 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 to apply 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, ECPC formed the Manufacturing Transformation Outsourcing Subcommittee in July 2008, and charged them 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: the traditional Integrated

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<sup>12</sup> More information about ECPC can be found at <http://www.census.gov/eos/www/naics/ecpc/ecpc.html>

<sup>13</sup> NAICS United States 2007, Executive Office of the President, Office of Management and Budget, 2007 page197.

<sup>14</sup> Ibid, p. 246.

Manufacturer (IM), the Manufacturing Service Provider (MSP), and the Factoryless Goods Producer (FGP). This table depicts the characteristics of each type:

**Characteristics of Types of Manufacturing Establishments**

	Integrated Manufacturer	Manufacturing Service Provider	Factoryless Goods Producer
Owns Intellectual property	Yes	No	Yes
Owns inputs	Yes	May or may not	May or may not
Performs transformation activities	Yes	Yes	No
Owns and sells or transfers finished product	Yes	No	Yes

The team’s report also described a wide variety of classification options along with their strengths and weaknesses based on the appropriateness of product valuations and whether the option would support analysis. The classification options identified by the team are listed below:

**1. Manufacturing only**

Under the assumption that outsourcing the transformation steps of the manufacturing process is no different than outsourcing other steps, all FGP’s could be classified in the manufacturing sector along with Integrated Manufacturers and Manufacturing Service Providers. 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. The following two possibilities were considered under this option.

- 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. If the breakout data are not publishable or not collected, this option does not provide any useful data for calculation and analytical purposes. 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.
- Make new manufacturing industries for the classification of FGP establishments either by creating a new manufacturing subsector that would include breakouts for industries that had a significant number of FGP establishments or add 6-digit NAICS into the current manufacturing structure where warranted. If separate industries were created, it would be important that the new FGP industry product detail be collected at the 7-digit product level of the manufacturing numerical list to allow data analysis. If the breakout into its own industry makes the FGP data unpublishable, it is not a very useful distinction for data users. This option would allow the creation of continuous data series for currently existing manufacturing industries.

## **2. Wholesale Trade only**

All FGP establishments could be classified in the Wholesale Trade sector, since the composition of labor and capital expenses for FGPs is more like 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 aspects of the production process. On the other hand, wholesale trade margin is for the service of goods distribution only. Margin for an FGP would include the value of the services related to design and overseeing transformation in addition to goods distribution. The following two possibilities were considered under this option:

- Classify FGP establishments 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 impacting 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.
- Classify FGP establishments in wholesale trade in either one industry or in three separate industries: Own-brand importers (arrange transformation by overseas contractor and import and distribute the final good); Own-brand marketers (arrange transformation by overseas contractor and who drop ship the output to customers); and Domestic FGPs (arrange transformation by domestic contractors). This option supports calculations and analysis by allowing FGPs to be identified separately from traditional wholesalers. This potential benefit 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 and manufacturing data difficult.

## **3. Split between Manufacturing and Wholesale Trade**

Classify establishments that outsource overseas in wholesale trade and those that 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 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 to foreign contractors would result in classification changes that lessen the stability of the classification system.

## **4. Professional, Scientific and Technical Services**

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 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 this process and so FGPs would report the value of the good as well as the value of the R&D, the full value of the product.

## **5. Management of Companies and Enterprises**

Create a new 3-digit industry within Management of Companies and Enterprises defined as managing the production process. 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**

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. ECPC received only 10 comments in response to the outsourcing portion of the Federal Register with a split of opinions as to how FGP establishments should be classified. ECPC used the Manufacturing Transformation Outsourcing Subcommittee's paper, the Federal Register responses, and an examination of international classification guidance to aid them in forming a final classification decision.

ECPC decided that all factoryless goods producers should be classified in manufacturing with the specific industry classification based on the transformation production process used by the contractor. Furthermore, they encouraged programs to provide breakouts for IMs, FGPs, and MSPs within each industry to support data analysis needs. They carefully considered the ISIC4 classification recommendation to base classification solely on legal ownership of material inputs, but decided that control of the entrepreneurial aspects of the production process including economic ownership of material inputs was more appropriate using 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 indifferent 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 they have 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.”<sup>15</sup>

## **IMPLEMENTATION PLANNING**

Both the U.S. and international community realized that even after all the extensive research, outreach, and guideline update efforts had been completed, the economic statistical community still had a significant amount of work to do in order to implement the decisions that had been made and 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 U.S.

In 2007, the Conference of European Statisticians (CES) created an expert group on the Impact of Globalization on National Accounts. 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<sup>16</sup>. 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 work and included a chapter at the end outlining work still to be done. As a follow up to this effort, the CES requested Statistics Netherlands to elaborate on the remaining issues and this work resulted in the paper, “In-Depth Review on Global Manufacturing.”<sup>17</sup> It also led to the formation of a Task Force on Global Production by the CES, which is responsible for developing guidance on unresolved issues related to SNA2008 and BPM6 and on implementation aspects of these standards. The work of this Task Force is still ongoing.

In the U.S., ECPC recognized that the NAICS classification decisions they adopted would impact multiple U.S. agencies and programs within those agencies. Furthermore, ECPC realized that, as with any new concept, there would likely be some differences in interpretation across agencies during the implementation process, and these differences might lead to data inconsistencies. As a result, the ECPC sponsored a multi-agency task force to ensure consistent implementation of the inclusion of FGPs in the manufacturing sector in NAICS 2012.

The following organizations are included in the team’s membership:

- BLS – Industry Employment Statistics, International Prices, Producer Prices, Productivity and Technology,
- Census – Classification, Manufacturing & Construction, Service Sector Statistics, Foreign Trade, Business Accounting Practices
- BEA – Industry Accounts, International Economics, National Economic Accounts
- FED – Industrial Production
- International Trade Commission – Research Division

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<sup>15</sup> Economic Classification Policy Committee (ECPC) Recommendation for Classification of Outsourcing in North American Industry Classification System (NAICS) Revisions for 2012.

<sup>16</sup> United Nations (2011), The Impact of Globalization on National Accounts, New York and Geneva.

<sup>17</sup> Statistics Netherlands (2011), In-Depth Review on Global Manufacturing, Geneva

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 projected completion date was late September 2010, a date based on Census deadlines for finalizing forms for the 2012 Economic Census.

The group's analysis of the issues related 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. The team identified a number of difficulties related to the detailed steps that would be required to accurately measure economic activity under the new definitions. 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 only applying some of the rules. They decided that this approach would be problematic since it would result in multiple series breaks over time, especially at aggregate levels.

As a result, in a September 2010 report, they recommended that full implementation of the outsourcing redefinitions should be delayed with a goal of the 2017 Economic Census. This recommendation was accepted by ECPC and OMB in November 2010. Implementation was deferred and the interagency group was asked by ECPC to continue the work of coordinating the implementation of this change. The remainder of this paper will discuss the work of the U.S. FGP Implementation Planning Group.

## **U.S. IMPLEMENTATION ISSUES**

### **Applying the concept of Economic Ownership**

Internationally, the concept of economic ownership was integral to many of the decisions made related to the handling of transactions. As was mentioned earlier in the paper, according to SNA 2008, the economic owner of a product or service is the unit that accepts the risks and accrues the rewards involved in the economic activity related to that product. Within the SNA, a transaction is recorded only when economic ownership of the product changes. 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. As a result, the implementation group determined that an in-depth understanding of the concept of economic ownership was essential to successful implementation of the FGP concept and identified the following detailed definitional criteria.

To be the economic owner of a product, an establishment must do all of the following:

1. **Control the intellectual property (IP) or design used in the final product** – Control of the IP means that the establishment either has developed the IP internally, purchased the IP from another firm, or has negotiated to lease the IP from another firm. For a domestic establishment with a foreign affiliate, it is possible that the U.S. establishment could be leasing the IP from its

affiliate. It is also possible that IP could be leased to more than one economic owner. From a business function standpoint, an establishment is the economic owner of the Intellectual Property (IP) for a product if they have the right to use it in their products, redistribute it, and can independently change the design of the final product.

2. **Control production of the final product** - There are many aspects to controlling production 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:
  - a. The economic owner could purchase the inputs and ship them to the MSP.
  - b. The economic owner could arrange to have them shipped to the MSP from another domestic or foreign location.
  - c. The economic owner could control inputs by just approving 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. Economic owners can decide whether to add or delete product lines, expand their business, move into a different business, or leave the business entirely. The economic owner must also be able to report the cost of manufacturing service.

3. **Control the sale of the product** - 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. It also must be able to report the value of those shipments.
4. **Assume entrepreneurial risk** - 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 and 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 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 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. (See the latest version of the \_\_.) 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, the decision tree reflected those possibilities. The decision tree reflects what the team considered would be the 'ideal' implementation from a conceptual standpoint. The decision tree is displayed on page 16

The team recognized there may be practical difficulties in implementing this ideal scenario due to 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.

In some situations, it may be difficult to assign economic ownership to a specific establishment that is not performing transformation activities. 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-establishment enterprises in manufacturing industries generally include establishments that perform transformation activities and establishments that control and/or provide support to the production activities. When all the establishments of an enterprise are in the U.S., 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, production and sale of products, and 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.<sup>18</sup> 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.

Some of the countries in the EU have begun to form groups to work together to ensure that transactions of MNEs are treated consistently across national accounts and national economic statistics. The U.S.

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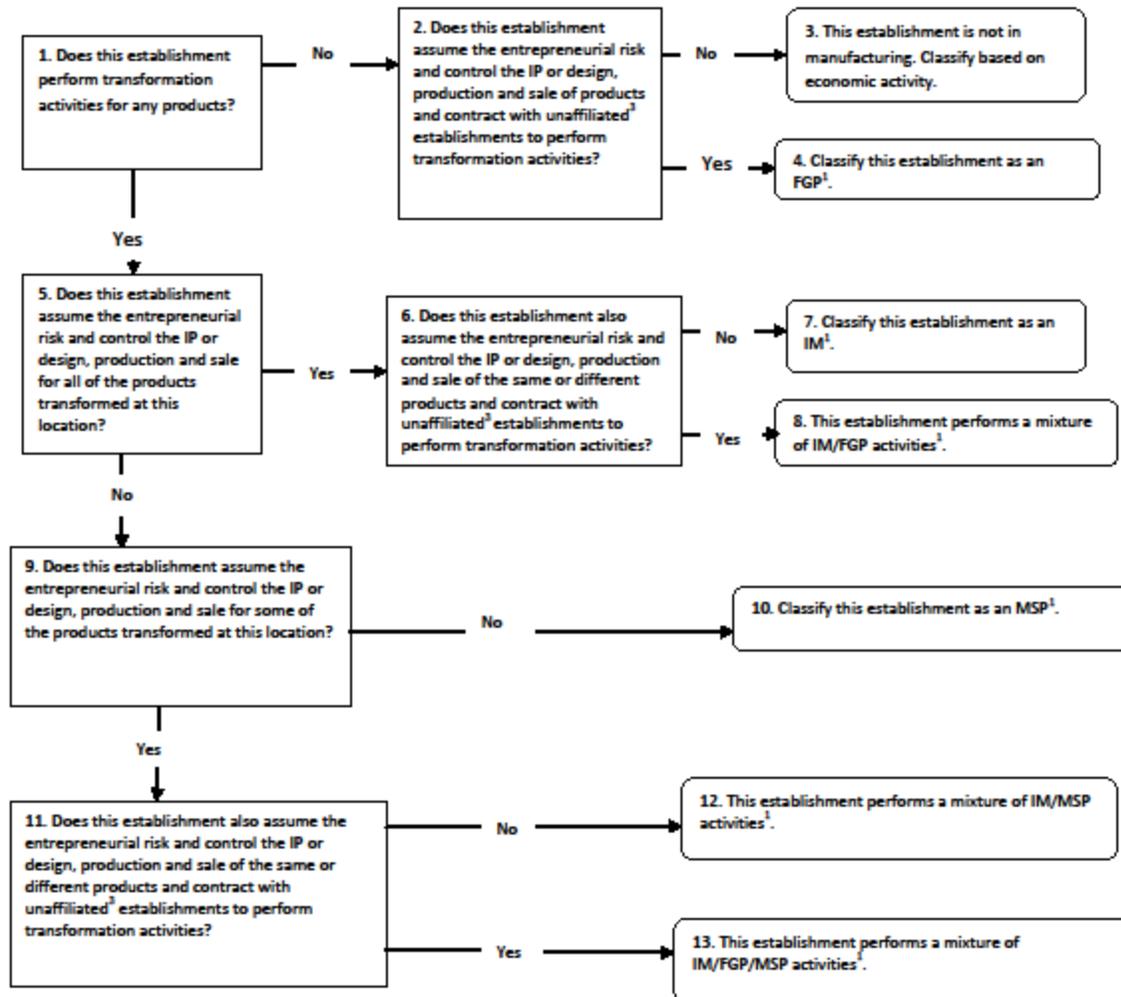
<sup>18</sup> Desai, M. A. (2009), "The Decentering of the Global Firm," *World Economy*, 32: pp. 1271–1290.

interagency group believes that the complexity of this issue will make it difficult for agencies/programs to make consistent decision about the establishments of individual enterprises as well as to make consistent decisions across enterprises. In addition, the U.S. interagency group is concerned about the inefficient allocation of resources if each agency/program works independently to resolve these issues.

To address this problem, the U.S. interagency group has recently proposed that as part of the plan for the implementation of the FGP concept, ECPC should form a standing cross-agency group to make classification recommendations for the major multinational enterprises that operate in the United States. This proposed new standing cross-agency group might also be charged with the responsibility for proposing fallbacks from the ideal implementation, if needed. Census, BEA, and BLS each collect a different set of detailed statistical data from enterprises 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 revenues that should be attributed to each. In order for this approach to be successful, there would also have to be cross-agency agreement that the decisions made based on this group's recommendations would be implemented consistently.

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. Although BLS and Census currently have an MOU allowing data sharing of data for some statistical purposes, this agreement is limited to data that are not intermingled with IRS data. Such a limitation would probably also need to be applied to any expanded data sharing capabilities in order to improve the likelihood of approval. The FGP Implementation Planning Group realizes that it may be somewhat early in the implementation planning process to be considering such a process, but it routinely takes a long time to craft interagency data sharing agreements. As a result, if it is determined by ECPC that this type of data sharing might be advantageous to U.S. economic statistics, it would be appropriate to begin pursuing this course of action in a timely manner. ECPC has not yet begun to consider the proposal to create this new standing cross-agency group.

Outsourcing Decision Tree – Ideal Definitions  
September 25, 2012



1 If an establishment performs a mixture of IM, FGP and/or MSP activities, it should be classified into one of the three unique subindustries, IM, MSP or FGP based on where most of their activity occurs.

2 If an establishment has revenue from products associated with more than one industry, it should be classified in the industry associated with the product that accounts for the plurality of revenue

3 All foreign establishments should be treated as unaffiliated

## Understanding Data Needs

In order to successfully implement the manufacturing redefinition clarification, statistical agencies need to determine the data necessary to accurately calculate statistics that reflect the inclusion of factoryless goods manufacturers in manufacturing. The following categories of data needs were identified by members of the Planning Group:

### Data Continuity

It is important to both statistical agencies and other data users to be able to distinguish between definitional and economic changes so they can create continuous time series and analyze data changes over time. It is not clear what impact the manufacturing definition clarification will have on aggregate statistics, but there is no question that it will result in major changes in the values attributable to specific industries, since some industries are more likely to outsource than others. 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.

### Data Production and Analysis

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 this goal, statistical programs will need values for inputs and outputs broken out by type of operation in order to support data analysis needs.

### Data adjustments

The “ideal” implementation of the manufacturing definition clarification fundamentally changes the definition of what is considered export and import activity for firms that are designated as FGPs and MSPs. Specifically, an import or export from the FGP or MSP standpoint will no longer simply be the crossing of a good or service over the U.S. border. For example, inputs shipped from a domestic FGP to a foreign MSP will not be considered exports. Similarly, the value of the manufacturing service provided by a foreign MSP for a domestic FGP will be treated as an import but the shipments of completed products from foreign MSPs to domestic FGPs will not. Since IMTS 2010 gave priority to the need for statistics that reflect physical border crossing of goods, customs data provided by IMTS differs conceptually from the ECPC FGP definition 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.

The interagency group then identified and prioritized 33 specific data needs and the following six were designated as highest priority:

1. For each industry in the 2017 Economic Census, the 2012 value of shipments (VOS) for all establishments moved into the industry and 2012 VOS for all establishments moved out of the industry due to manufacturing definition clarification.

For establishments that switch sectors, a total value for each sector where establishments originated would also be desired.

2. For each industry in the 2017 Economic Census, the 2017 VOS for all establishments moved into the industry and 2017 VOS for all establishments moved out of the industry due to manufacturing definition clarification

For establishments that switch sectors, a total value for each sector where establishments originated would also be desired.

3. Separate VOS from IM, MSP, and FGP activities by industry
4. Separate cross-industry wherever-made and primary product VOS from IM, MSP, and FGP activities within each industry
5. Unemployment Insurance frame that both reflects ECPC definitions and includes an indicator of type of establishment - IM, MSP or FGP for manufacturers
6. Transaction values by Harmonized Classification code for:
  - a. Goods sent for further processing shipped from a FGP to an MSP or
  - b. Inputs shipped from a foreign FGP to a domestic MSP

This will allow these values that will have been reflected as exports in U.S. Customs records to be excluded from the BLS International Price Program (IPP) sampling frames.

### **Determining Data Availability**

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 10Ks) 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. Census included several such questions on some 2007 Economic Census Forms and analysis of the results of those questions is ongoing. The interagency group also worked with Census staff to develop special inquiry questions related to outsourcing for the 2012 Economic Census. These questions served the dual purpose of testing potential questions and identifying establishments that would likely be classified as FGPs when the 2017 Economic Census is conducted. Special inquiry questions were also added to the Census Bureau's annual Company Organization Survey (COS) that were designed to help identify companies engaged in outsourcing and to provide insight into the extent of outsourcing at the enterprise level. In addition, contract manufacturing services questions have also been added to the following BEA forms: BE-120, Benchmark Survey of Transactions in Selected Services and Intellectual Property with Foreign Persons and BE-10, Benchmark Survey of U.S. Direct Investment Abroad.

### **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 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 and the size of those establishments in 2017. As a result, there is currently not enough information to quantify the exact impact until that information is 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 below:

**Expected Changes to Employment and Revenue**

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 in 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	The total will likely change but the direction and amount of the change are unknown. <ol style="list-style-type: none"> <li>1. FGPs may report revenues from products that would have previously been treated as imports.</li> <li>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.</li> <li>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.</li> </ol>
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.

**Expected Changes to Imports and Exports**

Value of U.S. Imports	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. <ol style="list-style-type: none"> <li>1. For products transformed by foreign MSPs for domestic FGPs: <ul style="list-style-type: none"> <li>• The full value of the products that they transformed and returned to the U.S. FGP will be excluded from imports.</li> <li>• The value of the manufacturing service that they performed and any inputs</li> </ul> </li> </ol>
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	<p>they provided will be included in imports.</p> <p>2. For products transformed by U.S. MSPs for foreign FGPs:</p> <ul style="list-style-type: none"> <li>• The full value of the products that they transformed that remain in the U.S. are included in imports.</li> <li>• The value of any inputs that they received from the foreign FGP will be excluded from imports.</li> </ul>
Value of U.S. exports	<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>1. For products transformed by foreign MSPs for domestic FGPs:</p> <ul style="list-style-type: none"> <li>• The value of products that have remained in a foreign MSP's country or were shipped via a foreign MSP to another country will be added to exports.</li> <li>• The value of the inputs that the domestic FGP provided to the MSP will be excluded from exports.</li> </ul> <p>2. For products transformed by U.S. MSPs for foreign FGPs:</p> <ul style="list-style-type: none"> <li>• The full value of any product that they transformed and returned to the foreign FGP will be excluded from exports.</li> <li>• The value of the manufacturing service that they performed and any inputs they provided will be included in exports.</li> </ul>

### 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 in specific industries. For planning purposes, it would be helpful to economic programs to identify which industries will likely be most impacted by the inclusion of FGPs in manufacturing in order to support any required decision making.

In order to develop measurement statistics, the following assumptions related to manufacturing industries were made:

- 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.
- Under current procedures, if a manufacturing establishment outsources all the transformation for their 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.
- The ratio of production employees to total employees will be lower for manufacturing industries that outsource transformation activities.
- 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 IO Tables were examined to find measures that might help identify industries that currently have characteristics

that could be indicative of FGP activity. The following set of potential measures was identified and values were calculated for each manufacturing industry along with average values for all manufacturing industries. In addition to the average, a level was selected for each measure to indicate a value that was significantly higher/lower than the average.

### Industry Impact Analysis Measures

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

For each industry, a value was calculated for each measure and compared to the average for all manufacturing industries. For most of the measures, values higher than the average were considered indicative of potential FGP activity. For number of production workers/total employment, values lower than the average were considered indicative of potential FGP activity. Based on these results, industries were placed in one of three categories indicating their likelihood of being impacted by the manufacturing redefinition. A complete list of the industries in the highest likelihood category has been included in Appendix A. An examination of the list shows that approximately 70 percent of the industries in the NAICS Apparel manufacturing and Computer and electronic product manufacturing subsectors were assigned to the highest likelihood category. This is consistent with the generally accepted assumption that these two subsectors will be strongly impacted by the manufacturing redefinition.

### Results of Manufacturing Industry Impact Analysis

Category	Criteria	% 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	33	30	25
Medium likelihood	3 measures above average with fewer than 2 significantly above or 2 above average	40	34	39
Lowest Likelihood	0 or 1 measure above average	27	36	36

## **Analysis of Wholesale Trade 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 U.S. The products are either imported into the U.S. and then sold or they are sold and then drop-shipped directly from a foreign location to the United States customer. It is expected that many of the wholesale trade establishments categorized 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.<sup>19</sup> 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 increase by about 3 percent, sales would increase by about 4 percent, and employment would increase by about 2 percent. The Wholesale Trade industry groups that have the largest proportion of their sales from own brand importer-marketers are Apparel and Electrical and Electronic Goods.

## **Analysis of Results of Special Inquiry Questions**

Some analysis related to impact has been already been published using the results from the special inquiry questions on the 2007 Economic Census.<sup>20</sup> Internal analysis is underway in both Census and BEA based on the results of the Census 2010 COS survey and the BEA BE-120 and B-10 surveys. Plans are underway at Census to study the results of the 2012 Economic Census. The goals of the research are to gauge the impact of the redefinition, provide input into the creation of questions for the 2017 Economic Census, and identify establishments that are likely to change industry classification. Additionally, the interagency group is working on a research proposal using data from the 2012 Economic Census and COS survey with the goal of improving the understanding of the expected impacts of ECPC's classification decisions and supporting the implementation planning efforts of individual statistical programs.

## **OUTREACH**

As mentioned earlier, the interagency group has undertaken a significant effort of information gathering outreach to companies and associations with the goal of understanding how establishments typically manage and record outsourcing activities. The group recognized that the acceptance of the concept of a factoryless goods producer will require a paradigm shift for many people and organizations. As a result,

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<sup>19</sup> The detailed data on Wholesale Trade by Type of operation can be found at [http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN\\_2007\\_US\\_42SXS04&prodType=table](http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ECN_2007_US_42SXS04&prodType=table)

<sup>20</sup> For more information see Outsourcing, Offshoring and Trade: Identifying Foreign Activity Across Census Data products, (Jarmin, Krizan and Tang) and Breaking Up Is Hard To Do: How Firms Fragment Production Across Locations (Fort).

they determined that an educational outreach campaign is necessary to explain the changes prior to the publication of data based on the redefinitions. A decision was made to approach educational outreach in stages. Members of the group began educational outreach by giving presentations on the concept in their own programs or agencies. Questions and feedback from the presentations helped the group identify issues that needed further investigation and/or documentation. A few educational presentations were given to associations, primarily to give them background information so that they could respond to research type questions related to outsourcing practices. The next step is to present the FGP concept to outside experts and obtain their input regarding the concept and its implementation. Outreach to the general public will follow later, after the 2012 Economic Census data has been analyzed and detailed implementation information is available.

Appendix A. Manufacturing Industries Most Likely to be Impacted by Manufacturing Redefinition

2007 NAICS code	2007 NAICS code Title
311111	Dog and cat food manufacturing
311811	Retail bakeries
313210	Broadwoven fabric mills
313222	Schiffli machine embroidery
313241	Weft knit fabric mills
313249	Other knit fabric and lace mills
314121	Curtain and drapery mills
314129	Other household textile product mills
314911	Textile bag mills
314912	Canvas and related product mills
314999	All other miscellaneous textile product mills
315191	Outerwear knitting mills
315211	Men's and boys' cut and sew apparel contractors
315212	Women's, girls', and infants' cut and sew apparel contractors
315222	Men's and boys' cut and sew suit, coat, and overcoat manufacturing
315223	Men's and boys' cut and sew shirt (except work shirt) manufacturing
315224	Men's and boys' cut and sew trouser, slack, and jean manufacturing
315225	Men's and boys' cut and sew work clothing manufacturing
315228	Men's and boys' cut and sew other outerwear manufacturing
315231	Women's and girls' cut and sew lingerie, loungewear, and nightwear manufacturing
315232	Women's and girls' cut and sew blouse and shirt manufacturing
315233	Women's and girls' cut and sew dress manufacturing
315234	Women's and girls' cut and sew suit, coat, tailored jacket, and skirt manufacturing
315239	Women's and girls' cut and sew other outerwear manufacturing
315291	Infants' cut and sew apparel manufacturing
315292	Fur and leather apparel manufacturing
315299	All other cut and sew apparel manufacturing
315999	Other apparel accessories and other apparel manufacturing
316219	Other footwear manufacturing
316991	Luggage manufacturing
316992	Women's handbag and purse manufacturing
316993	Personal leather good (except women's handbag and purse) manufacturing
316999	All other leather good and allied product manufacturing
321992	Prefabricated wood building manufacturing
322223	Coated paper bag and pouch manufacturing
323113	Commercial screen printing
323114	Quick printing
323115	Digital printing
323122	Prepress services
325412	Pharmaceutical preparation manufacturing
325413	In-vitro diagnostic substance manufacturing
325414	Biological product (except diagnostic) manufacturing
325620	Toilet preparation manufacturing
327112	Vitreous china, fine earthenware, and other pottery product manufacturing
327113	Porcelain electrical supply manufacturing

Appendix A. Manufacturing Industries Most Likely to be Impacted by Manufacturing Redefinition -  
Continued

2007 NAICS code	2007 NAICS code Title
327122	Ceramic wall and floor tile manufacturing
327123	Other structural clay product manufacturing
327310	Cement manufacturing
327910	Abrasive product manufacturing
327991	Cut stone and stone product manufacturing
331111	Iron and steel mills
331513	Steel foundries (except investment)
332117	Powder metallurgy part manufacturing
332211	Cutlery and flatware (except precious) manufacturing
332212	Hand and edge tool manufacturing
332214	Kitchen utensil, pot, and pan manufacturing
332312	Fabricated structural metal manufacturing
332410	Power boiler and heat exchanger manufacturing
332611	Spring (heavy gauge) manufacturing
332722	Bolt, nut, screw, rivet, and washer manufacturing
332911	Industrial valve manufacturing
332912	Fluid power valve and hose fitting manufacturing
332919	Other metal valve and pipe fitting manufacturing
332993	Ammunition (except small arms) manufacturing
332995	Other ordnance and accessories manufacturing
332996	Fabricated pipe and pipe fitting manufacturing
332997	Industrial pattern manufacturing
332998	Enameled iron and metal sanitary ware manufacturing
332999	All other miscellaneous fabricated metal product manufacturing
333120	Construction machinery manufacturing
333132	Oil and gas field machinery and equipment manufacturing
333210	Sawmill and woodworking machinery manufacturing
333220	Plastics and rubber industry machinery manufacturing
333291	Paper industry machinery manufacturing
333292	Textile machinery manufacturing
333293	Printing machinery and equipment manufacturing
333294	Food product machinery manufacturing
333298	All other industrial machinery manufacturing
333313	Office machinery manufacturing
333314	Optical instrument and lens manufacturing
333315	Photographic and photocopying equipment manufacturing
333319	Other commercial and service industry machinery manufacturing
333512	Machine tool (metal cutting types) manufacturing
333513	Machine tool (metal forming types) manufacturing
333516	Rolling mill machinery and equipment manufacturing
333518	Other metalworking machinery manufacturing
333612	Speed changer, industrial high-speed drive, and gear manufacturing
333613	Mechanical power transmission equipment manufacturing

Appendix A. Manufacturing Industries Most Likely to be Impacted by Manufacturing Redefinition -  
Continued

2007 NAICS code	2007 NAICS code Title
333912	Air and gas compressor manufacturing
333921	Elevator and moving stairway manufacturing
333922	Conveyor and conveying equipment manufacturing
333992	Welding and soldering equipment manufacturing
333993	Packaging machinery manufacturing
333994	Industrial process furnace and oven manufacturing
333997	Scale and balance manufacturing
333999	All other miscellaneous general purpose machinery manufacturing
334112	Computer storage device manufacturing
334119	Other computer peripheral equipment manufacturing
334210	Telephone apparatus manufacturing
334220	Broadcast and wireless communications equip.
334290	Other communications equipment manufacturing
334310	Audio and video equipment manufacturing
334413	Semiconductor and related device manufacturing
334414	Electronic capacitor manufacturing
334415	Electronic resistor manufacturing
334417	Electronic connector manufacturing
334419	Other electronic component manufacturing
334510	Electromedical and electrotherapeutic apparatus manufacturing
334511	Search, detection, navigation, guidance, aeronautical, and nautical system and instrument manufacturing
334512	Automatic environmental control manufacturing for residential, commercial, and appliance use
334513	Instruments and related products manufacturing for measuring, displaying, and controlling industrial process variables
334515	Instrument manufacturing for measuring and testing electricity and electrical signals
334516	Analytical laboratory instrument manufacturing
334517	Irradiation apparatus manufacturing
334518	Watch, clock, and part manufacturing
334519	Other measuring and controlling device manufacturing
334611	Software reproducing
335121	Residential electric lighting fixture manufacturing
335129	Other lighting equipment manufacturing
335221	Household cooking appliance manufacturing
335314	Relay and industrial control manufacturing
335999	All other miscellaneous electrical equipment and component manufacturing
336411	Aircraft manufacturing
336412	Aircraft engine and engine parts manufacturing
336413	Other aircraft parts and auxiliary equipment manufacturing
336414	Guided missile and space vehicle manufacturing
336419	Other guided missile and space vehicle parts and auxiliary equipment manufacturing
337125	Household furniture (except wood and metal) manufacturing
337127	Institutional furniture manufacturing
337129	Wood television, radio, and sewing machine cabinet manufacturing

Appendix A. Manufacturing Industries Most Likely to be Impacted by Manufacturing Redefinition -  
Continued

2007 NAICS code	2007 NAICS code Title
337212	Custom architectural woodwork and millwork manufacturing
339112	Surgical and medical instrument manufacturing
339113	Surgical appliance and supplies manufacturing
339114	Dental equipment and supplies manufacturing
339911	Jewelry (except costume) manufacturing
339912	Silverware and hollowware manufacturing
339914	Costume jewelry and novelty manufacturing
339931	Doll and stuffed toy manufacturing
339941	Pen and mechanical pencil manufacturing
339942	Lead pencil and art good manufacturing
339943	Marking device manufacturing
339944	Carbon paper and inked ribbon manufacturing
339950	Sign manufacturing
339994	Broom, brush, and mop manufacturing
339999	All other miscellaneous manufacturing