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International and Domestic Product Classifications

**William A. Donnelly
Senior Research Economist**

**Office of Economics
U.S. International Trade Commission**

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address correspondence to:
**Office of Economics
U.S. International Trade Commission
Washington, DC 20436 USA**

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by
William A. Donnelly*

Abstract

The globalization of the world economies (U.S. trade share in 1998 was 29.3 percent) necessitates improved economic statistics. The interest in developing conceptual economic frameworks for industry and product classification systems has intensified because of the need for data to be comparable for domestic production and trade with information from other countries in that comparability allows for more meaningful analyses of international trade relationships. However existing product data systems are organized differently one from the other, and this presents difficulty in the construction of complete and consistent data bases. Indeed, while this issue of international comparability of data is being discussed in many fora, e.g., APEC, UN, WCO, etc., practicality dictates that the Harmonized System (HS) should serve as the foundation for the goods definitions in any new product (goods and services) classification system developed for the United States.

Domestically and internationally there is a need for: (1) a wherever-produced, product-oriented system, (2) a highly disaggregated level of product detail, (3) comparability between domestic production and trade data statistics, and (4) more adequate detail as to services industries. Addressing each of these issues is of major importance. This is so because the data obtained from existing production and international trade classifications are inconsistent; i.e., none of the domestic or international product classifications is based upon a single unifying, or even the same, economic concept.

The Office of Management and Budget established the Economic Classification Policy Committee with the charge of initiating a “fresh slate” examination of economic classification systems. This U.S. effort was joined by the other members of the NAFTA, and the three countries agreed that conceptually-based classifications would be adopted. In 1997, work on constructing a “supply-side, production-oriented” industry classification resulted in the adoption of the North American Industry Classification System (NAICS). Work within NAFTA has now begun on developing a “demand-side, market-oriented” product classification. The resulting North American Product Classification System (NAPCS) is intended to provide the requisite comparability of product data.

This paper describes several existing classification systems for products and illustrates some of the problems that will be encountered in implementing a demand-side product classification. The paper is designed to serve as background in defining NAPCS.

* William Donnelly is senior research economist at the United States International Trade Commission. The opinions expressed in this paper are the author’s and do not necessarily represent those of the U.S. International Trade Commission or any of its Commissioners.

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I. Introduction

The Office of Management and Budget (OMB) established the Economic Classification Policy Committee (ECPC) in July, 1992. OMB charged the Committee “with a ‘fresh slate’ examination of economic classifications for statistical purposes.”¹ The ECPC considered issues with respect to the desirability and feasibility of constructing conceptually-based classification systems, particularly with regard as to what scheme might replace the Standard Industrial Classification (SIC), and the U.S. effort was joined by the other members of the North American Free Trade Agreement (NAFTA), i.e., Mexico’s Instituto Nacional de Estadística, Geografía e Informática (INEGI) and Statistics Canada, in developing consistent classifications systems within NAFTA. This three-country group agreed that conceptually-based classifications should be adopted and the group proposed that a unique “supply-side, production-oriented” industry classification be implemented; the proposal resulted in the North American Industry Classification System (NAICS). (This is pronounced so as to rhyme with “lakes.”) NAICS replaces the 1987 U.S. SIC and the classification systems of Canada (1980 SIC) and Mexico (1994 Mexican Classification of Activities and Products (CMAP). For the United States, NAICS came into effect on January 1, 1997.² NAICS represents the

first industry classification system that was developed in accordance with a single principle of aggregation, the principle that producing units that use similar production processes should be grouped together, [and t]hough NAICS differs from other industry classification systems, statistics compiled on NAICS are comparable with statistics compiled according to the latest revision of the United Nations’ International Standard Industrial Classification (ISIC, Revision 3) for some sixty high level groupings.³

* William Donnelly is senior research economist at the United States International Trade Commission working with the Economic Classification Policy Committee and the Bureau of the Census on product classification issues. The author thanks Tim Aylor, Dave Beck, Miguel Cuves, Irwin Gerduk, Ronald Heller, Karen Horowitz, David Ingersoll, John Kort, Kyle Johnson, Michael Mohr, Harvey Monk, Pamela Powell-Hill, Eugene Rosengarden, and Ken Young for helpful comments on earlier drafts of this paper. The opinions expressed in this paper are the author’s and do not necessarily represent those of the United States International Trade Commission, any of its Commissioners, the Bureau of the Census, or the U.S. Department of Commerce.

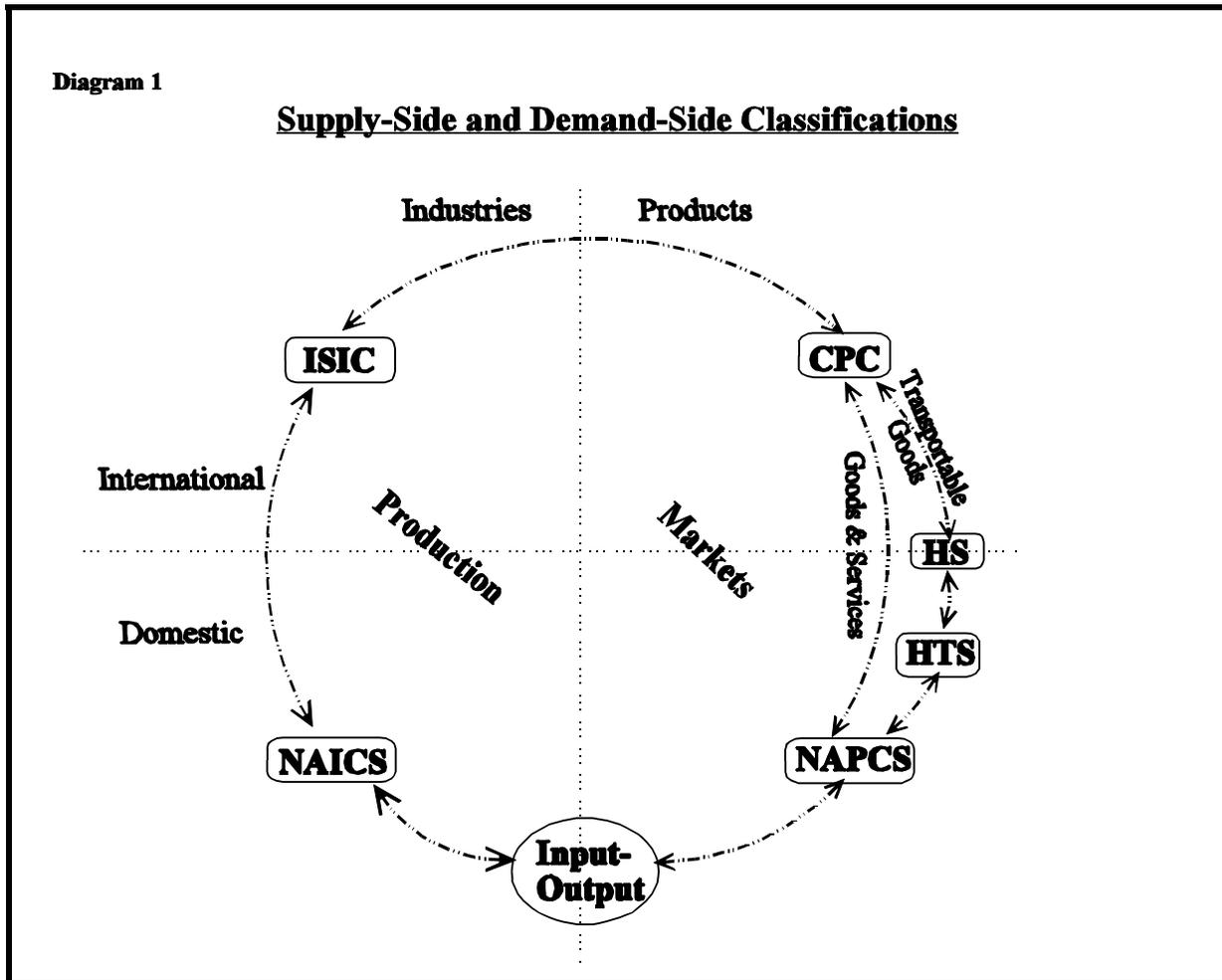
The current phase of the classification review is now the considering what the appropriate structure for a conceptually based "demand-side, commodity-oriented" classification should be. The ECPC states that:

Having now largely accomplished the industry classification objectives for NAICS, the ECPC herein announces a new initiative (hereafter, the Initiative) to develop a comprehensive classification system for the products produced by NAICS industries. Discussion is also proceeding to determine if agreement on a product classification system can be reached among Canada, Mexico, and the United States. The long-term objective of the Initiative is to develop a market-oriented, or demand-based, classification system for products that (a) is not industry-of-origin based but can be linked to the NAICS industry structure, (b) is consistent across the three NAICS countries, and (c) promotes improvements in the identification and classification of service products across international classification systems, such as the Central Product Classification System of the United Nations.

[T]he overriding objective of Phase 1 of the Initiative is to systematically explore the development of a formal classification system for services that can be used throughout the economics community of users to coordinate the collection, tabulation, and analysis of data on the value of the detailed products produced by service industries and on the prices charged for those products. Although preliminary, the results from phase 1 will be used to guide the collection of data for service products in the affected industries during the 2002 Economic Census. In contrast to Phase 1, the ultimate objective of Phase 2 of the Initiative will be to develop an agreed-upon, integrated, and comprehensive list of products, product definitions, product codes, and a demand-side/market-oriented classification framework for both services and goods alike.^{4, 5}

On February 2, 1999, at the ECPC hosted kickoff conference beginning the effort on developing this new product classification at which Enrique Ordaz, Mexico's representative to the three-country ECPC, suggested that the new product classification be called the North American Product Classification System (NAPCS). (This is pronounced "naps.")

The conceptual framework of NAICS and NAPCS are the economics of supply and demand. The supply-side concept of organizing activities into industries is based upon how goods and services are produced, while the demand-side organization of products reflects the markets in which those goods and services are traded. The following diagram illustrates the relationship among domestic and international classification systems in the context of the conceptually-based NAICS (supply-side, production-oriented) classification and the NAPCS (demand-side, market-oriented) classification schemas.



This working paper describes several (domestic and international) economic classification systems for products and illustrates some of the problems that will be encountered in achieving greater comparability. The needs and uses for a product classification are discussed in the *Federal Register* publication of the February, 1993, ECPC Issues Paper No. 1, Conceptual Issues.⁶

II. Principles of Classification

The desirability of providing analysts with the most useful data is the primary function of collecting economic statistics, and this is true both domestically and internationally. Domestically, in the keynote presentation at the plenary session at a 1990 Bureau of the Census (Census) conference, Jack Triplett reintroduced the issue of identifying the appropriate economic conceptual frameworks for economic classifications to the participating government statistical agencies.⁷ He proposed that consideration be given to adopting an economic framework for new classifications, wherein each of two frameworks would better satisfy distinctly different requirements of data users: these frameworks are the supply-side (input-based, production-oriented) and demand-side (commodity-based, market-oriented) concepts discussed in the ECPC Issues Paper cited above. In a subsequent Census conference held in Williamsburg, Robert McGuckin posed the rhetorical question “Can a thousand flowers bloom? And should they?” McGuckin continues this debate by stating:

The principle that the proper classification of economic data depends on use has been a central focus in the debate on economic classifications. This means that the statistical system must provide flexibility -- possibilities for generating multiple groupings of data to satisfy multiple objectives -- if it is to satisfy users. ‘Multiple uses’ refers to groupings of data based on different aggregations concepts or rules. The important point is that the rule(s) for grouping the data are determined by the use for which the data are being developed. [R]econfigurations of the basic data are very inexpensive compared to the cost of collecting the data.

It has been argued that the economic classification system should be based primarily on supply and demand considerations. The application of conceptual frameworks to real world data will involve analyst judgment and some compromises. Nevertheless, for every grouping of the data, there must be an explicit conceptual framework based on an economic issue(s) to be examined.

Flexibility in the statistical system implies that the basic data are sufficiently detailed to support use needs and are processed and maintained in a fashion that makes the use of a variety of aggregation rules possible. The idea is to develop very specific lists of the basic data. These lists should be independent of the aggregation rules used to develop various groupings and categories from the basic data.⁸

In Issues Paper No. 1, the ECPC defined the economic conceptual basis for a product classification as:

A demand-side, or commodity-oriented, classification concept, in contrast, yields a classification system based on use of the commodity or service. Commodities or services that serve similar purposes, that are used together, or that are functionally related in use, are grouped together. Both general approaches--supply-side or demand-side--are derived from economic theory, specifically the economic theory of aggregation. Under a demand-side concept, one would group together commodities or services that have similarities in use, that belong together or are used together for some purpose, or that define market groupings. A quite old idea is that demand groupings can be formed by considering the nature of substitutions.

Very close substitutes belong together; commodities or services that are not good substitutes belong in different categories. Granulated cane sugar and granulated beet sugar, for example, are probably indistinguishable in use (they are perfect substitutes) and accordingly belong together on the close-substitutes rule. The close substitutes method is sometimes known as the ‘gaps in nature’ approach: To define demand-side categories one looks for pronounced gaps in the chain of substitutes.⁹

Other groupings of commodities may be based upon the end use of the product or the mode of delivery of the good or service. There are several potential economic concepts for aggregating product data, and those concepts fall into two broad aggregation categories: functional and empirical (relational).¹⁰

The functional aggregation principle is based upon the degree substitution potential between products (goods or services). Substitution may range anywhere from a value of zero in the case of Leontief aggregation (input-output, fixed proportions) to infinity in the case of gap-in-nature aggregation wherein the goods (or services) are close substitutes.

Empirical (relational) aggregation is essentially statistical in character. This principle includes aggregation based upon the “composite commodity theorem” of Hicks,¹¹ and another form is identified as hedonic aggregation. Hicksian aggregation is defined by the similarity of price movements of the good (or service) over time. Hedonic aggregation identifies and is based upon specific values of the essential characteristics of a good (or service). The first form of empirical aggregation has a time series dimension, whereas the latter is a cross-sectional measurement.

The appropriate principle for classifying industries differs from the appropriate principle for classifying products (goods and services). Specifically, Triplett (1990) recommends:

Choosing to use a production aggregation theory ... means that the ... review committee would be instructed: Set up industry groupings according to production similarities; demand, use, and other considerations are irrelevant.¹²

The corollary principle for a product classification is choosing to use a commodity aggregation theory means that the Initiative committees would be instructed: Set up product or services groupings according to substitution similarities; demand, use, and other market considerations are most relevant. These definitions of the principles of groupings according to substitution similarities, including demand, use, and other market considerations, will be used in developing the new product classification system for the United States. Another way to express this is to say that, NAPCS involves consumption space. This space needs to be defined in the context of a detailed consumption function, since a product classification system should reflect the multistage consumer’s decision process; one which is finely parsed. For example, (1) major consumption groups: food, housing, health, transport, etc.; (2) alternatives within a major consumption group: fruit, meat, vegetables, drink, etc.; (3) specific choices within each alternative: fish, pork, lamb, beef, etc.; (4) selections within specific choices: top round, bottom round, sirloin, etc.; (5) selections within specialties: choice, standard; (6) etc., etc., until the finest level of product detail in the classification structure is attained.

III. Classification Systems

In considering the nature of, and most useful structure for, a demand-side, commodity-oriented classification system, one which is grounded in a single conceptual basis¹³ and one which will serve as the NAPCS product analog to NAICS, it is instructive to understand some characteristics of existing international and domestic product classifications. Whereas the primary focus will be on product classification systems, ones which aggregate individual commodities or services into product groupings, other classifications are mentioned where appropriate. The classifications examined include:

A. International Classifications

1. Harmonized Commodity Description and Coding System (HS) -- produced and maintained by the World Customs Organization;
2. Central Product Classification (CPC), Version 1 -- produced and maintained by the United Nations Department of Economic and Social Affairs Statistics Division;
3. Standard International Trade Classification (SITC), Revision 3 -- produced and maintained by the United Nations Department of Economic and Social Affairs Statistics Division; and,
4. International Standard Industrial Classification of All Economic Activities (ISIC), Revision 3 -- produced and maintained by the United Nations Department of Economic and Social Affairs Statistics Division.

B. U.S. Classifications

1. Harmonized Tariff Schedule of the United States Annotated (HTS) and Statistical Classification of Domestic and Foreign Commodities Exported from the United States (Schedule B) -- produced and maintained by the United States International Trade Commission and the Bureau of the Census, and implemented by the U.S. Customs Service;
2. Numerical List of Manufactured and Mineral Products and Current Industrial Reports Product Detail -- produced and maintained by the Bureau of the Census, U.S. Department of Commerce;
3. Producer Price Index Product Lines -- produced and maintained by the Bureau of Labor Statistics, U.S. Department of Labor; and,
4. Input-Output Commodity Classification System -- produced and maintained by the Bureau of Economic Analysis, U.S. Department of Commerce.

C. Other Country Classifications

1. Standard Classification of Goods (SCG) -- produced and maintained by Statistics Canada;
2. Australian and New Zealand Standard Commodity Classification (ANZSCC) -- produced and maintained by the Australian Bureau of Statistics.

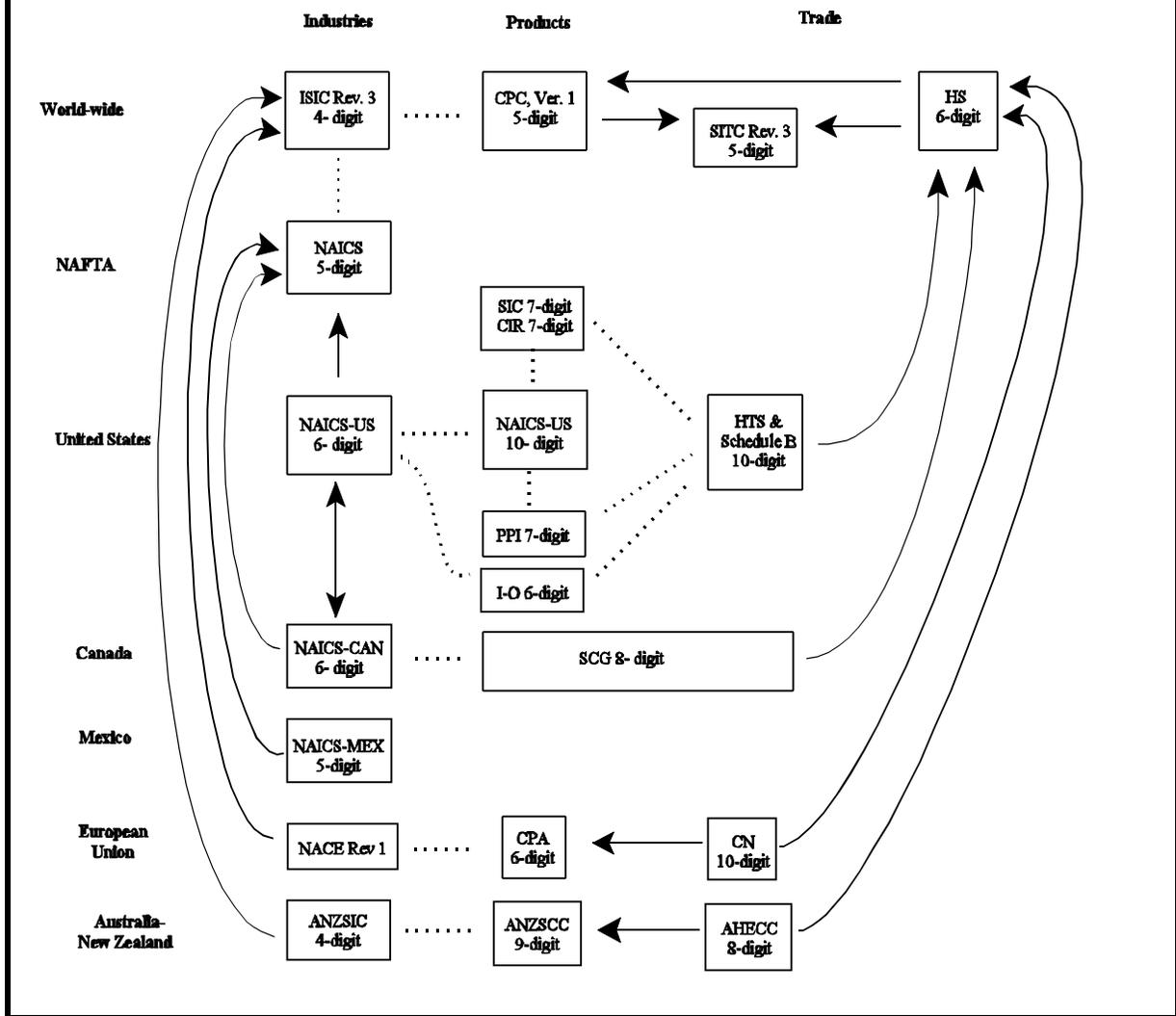
3. Classification of Products by Activity (CPA) -- produced and maintained by EUROSTAT; and,
4. Community Production (Prodcom) -- produced and maintained by EUROSTAT.

A number of the product classification systems now in effect have either been established or changed significantly in the past few years. Harmonization and comparability between the systems have been primary objects for these revisions. The systems have been reviewed and revised at approximately the same time, with the opportunity being afforded to incorporate the needs of the others into each. Strong efforts have been made to provide linkages among the systems to make them useful for the systems of national accounts, but this is a continuing process, since none of these classifications are based upon a single, unifying economic concept.

The following diagram illustrates the general relationships among the existing domestic and international classification systems. The arrows in the diagram suggest a formal (hierarchical) relationship whereas the dots suggest less formal (concorded) relations. These aspects are developed in the discussion of the various classifications and in the examples presented.

Diagram 2

Existing Domestic and International Classification Systems



It should be noted, that while some of the existing classifications are directly related one to the other (e.g., HTS and HS, NAICS-US, NAICS-CAN, NAICS-MEX and NAICS) most classification systems are only related through concordances, concordances constructed so as to enable data from different sources to be combined for analytical purposes. These mappings are characterized as informal, because concordances are too often modified by the individual analyst, the end user of the data, and are not the ones constructed by those who developed and who maintain the original classification.

A. International Classifications

Globalization and the rapid increase in the U.S. trade share¹⁴ in 1998, which has more than doubled to 29.2 percent from the 1980 level of 14.1 percent, necessitates improved domestic product statistics.

Table 1

Gross Domestic Product, Exports, and Imports* [billions of chained (1992) dollars]				
year	GDP	Exports	Imports	Trade Share
1930	\$719.7	\$29.4	\$35.4	9.0%
1940	\$941.2	\$35.4	\$37.8	7.8%
1950	\$1,611.3	\$51.4	\$62.0	7.0%
1960	\$2,262.9	\$86.8	\$108.1	8.6%
1970	\$3,397.6	\$158.1	\$223.1	11.2%
1980	\$4,615.0	\$331.4	\$321.3	14.1%
1990	\$6,136.3	\$792.6	\$889.0	27.4%
1998	\$7,551.9	\$984.7	\$1,222.9	29.2%

* Summary, 1929-97, *Survey of Current Business* (August 1998) and BEA WWW site 04/01/1999 for revised 1998 data in Table 3--see <http://www.bea.doc.gov/bea/dn/nipubl-d.htm#Table 3b>

Many of the points expressed by the United States International Trade Commission (USITC) during the 1987 Standard Industrial Classification revision process regarding the need for a more useful product classification remain of concern to the Commission today. These points include the requirement of: (1) a wherever-produced, product-oriented system, (2) data at a highly disaggregated level of product detail, (3) comparability between domestic production and trade data classifications, and (4) more detailed data as to services industries.¹⁵

Addressing each of these issues remains of major concern to the USITC because all of the existing product classifications (domestic production and trade data) are inconsistent with each other in their approach to their content; none of these product classifications are based upon a single unifying economic concept.

Furthermore, in the broader international context, the interest in developing conceptual economic frameworks for classifications has intensified. This is because of the globalization of economic activity and the need for users of product data to be able to compare domestic production and trade data with similar data from other countries, thereby allowing analyses of domestic and international trade relationships. At

present, however, the existing data systems are organized differently and are not comparable. Indeed, the issue of comparability of data systems is being discussed in many domestic and international fora, e.g., ECPC, NAFTA, APEC, OECD, UN, WTO, etc.¹⁶

For example, a panel of experts working under the aegis of the United Nations Economic and Social Affairs Statistics Division, the Central Product Code (CPC) Sub-Group of the Voorburg Group,¹⁷ reports that:

The issue of the conceptual basis of the structure of the CPC was discussed Whether the aggregation structure should group products by industry of origin, demand or function was discussed. A number of members of the Sub-Group expressed an interest in developing a demand based aggregation for the CPC, as an industry of origin based aggregation can be created, simply by regrouping products by the principal ISIC industry of origin indicated in the publication. The issue of the need for coordinated updating and revision of CPC, ISIC and related regional and multinational classifications such as NACE and CPA as outlined by EUROSTAT was brought before the Sub-Group and discussed. The Sub-Group agreed to recommend that revisions to the goods part of the CPC be coordinated with revisions to the Harmonized System.¹⁸

1. Harmonized Commodity Description and Coding System

Classification systems are designed to serve various purposes. For example, the need to monitor a country's imports so as to collect tariffs on dutiable goods requires a classification system in which the characteristics of each good are clearly identifiable to the customs agent or to a testing laboratory. That agent must be able readily to determine, through observation or measurement, the appropriate duty, if any, to be levied on the item. Most countries have agreed upon the commonality of the 6-digit Harmonized Commodity Description and Coding System (HS) classification as the basis for classifying internationally traded goods. Flexibility within the HS is provided by allowing additional digits to be added beyond the 6-digit level that will identify more detailed tariff line items and allow for further statistical detail, wherever necessary. The HS scheme for classifying internationally trade goods is based upon several criteria: (1) characteristics (materials of composition) of the good, (2) degree of processing of the good, (3) use or function of the good and, (4) according to economic activity. The U.S. implementation of the HS, the Harmonized Tariff Schedule of the United States Annotated (HTS) for exported goods, extends the HS to an 8-digit code to identify individual U.S. tariff lines, and further to a 10-digit level of detail for statistical purposes.

The Harmonized Commodity Description and Coding System (HS) is a 6-digit international commodity classification system for transportable goods; this nomenclature was published by the Customs Co-operation Council (CCC) in 1959 as the 4-digit Brussel's Tariff Nomenclature (BTN). The BTN was updated in 1974 and renamed the Customs Co-operation Council Nomenclature (CCCN). The CCCN, along with other international classification systems (chiefly the SITC, see below), served as the basis for the 6-digit Harmonized System, which was implemented internationally in 1988, and in the United States, in 1989. The CCC began referring to itself as the World Customs Organization (WCO) in 1994.¹⁹ More than 171 countries, including the U.S., Canada, Mexico, Japan, the European Union (EU), and most of our other major trading partners, now use the system as a basis for classifying imports and exports of goods.

The HS is arranged into 21 sections, comprising a total of 96 chapters (chapters 1 to 97; Chapter 77 is reserved for future use) that cover broad ranges of like products. Examples of these sections are Section I, which covers live animals and animal products, Section II, which covers vegetable products, and Section XI, which covers textiles and textile products. Within each section are chapters that define a narrower range of products. For example, within Section I, Live Animals; Animal Products are the following chapters: Chapter 1, Live Animals; Chapter 2, Meat and Edible Offal Products; Chapter 3, Fish and Crustaceans, Molluses, and Other Aquatic Invertebrates; and so forth. Within Section XI, Textiles and Textile Products, there are chapters on silk (Chapter 50), wool (Chapter 51), cotton (Chapter 52), and so forth.

The first two digits of the system represent the chapter; the next two digits represent the headings within that chapter. Headings are 4-digit broad commodity groupings, of which there are 1241 in the 1996 version of the HS. These 4-digit broad groupings are then subdivided into 6-digit commodities, of which there are approximately 5,113. Beyond the 6-digit level, individual countries can further subdivide the HS nomenclature for tracking imports and exports, as the U.S. has done. The following illustrates the structure of the HS and shows how the U.S. in its nomenclature has provided for more detail to the 10-digit level.

Table 2

HS Chapter 52 -- Cotton				
HS 4-digit	HS 6-digit	U.S. HTS 8-digit	U.S. HTS 10-digit	Article Description
5208				Woven fabrics of cotton, containing 85% or more by weight of cotton, weighing not more than 200 g/m ² .
	5208.11			Unbleached, plain weave, weighing not more than 100 g/m ² .
		5208.11.20		Of number 42 or lower number.
			5208.11.20.20	Poplin or broadcloth.

The HS is a product system that was developed primarily for use in classifying and collecting data on international transactions, i.e., imports and exports, though it also serves as the basis for domestic production, transportation and tax regimes in many countries. It recognizes the requirements of legal administration by customs administrations. Other international product classification systems, discussed below, are not sufficiently rigorous for use in administering customs.

The organizational framework, legal texts and notes, and related elements of the HS are organized to facilitate consistent legal interpretation. The framework is thus based on legal principles, rather than upon production patterns or a theoretical concept and are defined by characteristics of the goods. The characteristics are objective--those that are inherent in the goods. The principal characteristics represented in the HS detail include:

- o Level or stage of processing and market general categories, such as consumer versus industrial goods, and final goods versus intermediate goods, and those latter versus parts. Strong emphasis is placed on distinguishing goods based on their stage of processing.
- o Constituent material
- o Use, to the extent that utilization can be determined objectively. For example there are HS codes for machinery for making pulp, machinery for making paperboard, machines for extruding, drawing, texturing or cutting man-made textile materials, etc.

The stage of processing concept can be seen clearly in the organization of many of the sections and chapters. Thus Sections I-IV cover most products of animal and vegetable materials, with the least-processed first (Sections I-II, representing Live Animals, Animal products; and Vegetable Products, respectively) and the most processed last (Section IV, Prepared Foodstuffs; Beverages, Spirits and Vinegar; Tobacco and Manufactured Tobacco Products). Thus live animals are in Section I, Chapter 1 and meat is in Section I, Chapter 2, while meat preparations, in this scheme, are in chapter 16 of Section IV; fresh fruits and vegetables are in Section I, chapters 7 and 8, and fruit or vegetable preparations are in Section IV, Chapter 20. As another example, Section V, Mineral Products covers most products of mining, but processed products of mining can be found mainly in Sections XIII, Articles of Stone, Plaster, Cement, Asbestos, Mica or Similar Materials; Ceramic Products; Glass and Glassware and Section XV, Base Metals and Articles of Base Metal.

Some sections are based on constituent materials. For example, Section VII covers Plastic and Articles Thereof; and Rubber and Articles Thereof and Section IX covers Wood and Articles of Wood; Wood Charcoal; Cork and Articles of Cork; Manufactures of Straw, of Esparto or of Other Plaiting Materials; Basketware and Wickerwork. Other sections such as Sections XVI through XX cover goods that are classified largely on use. These sections include Section XVII, Vehicles, Aircraft, Vessels and Associated Transport Equipment, and Section XIX, Arms and Ammunition; Parts and Accessories.

Often, chapters within a section follow a stage of processing rationale. Section XII includes all textiles and textile products. Within the section the chapters are distinguished by stage of processing. Thus, chapters 50-56 cover the production of the fiber, yarn, thread, or simple, woven fabric, and Chapters 57-63 cover the production of the specialty fabrics and of finished products such as carpets and apparel.

The detail of the headings and subheadings places considerable emphasis on broad economic markets. For machinery and apparatus, separation is generally provided for parts; and often for goods for personal or household use versus industrial use. One example is the detail of heading 84.14, Air or Vacuum Pumps, Air or Other Gas Compressors and Fans; Ventilating or Recycling Hoods Incorporating a Fan, Whether or not Fitted with Filters. Stage of processing and general economic market category are first recognized in the separation of parts (subheading 8414.90). Most goods that are chiefly for personal or household use are then provided for in subheading 8414.20, Hand or Foot Operated Air Pumps; subheading 8414.51, Table, Floor, Wall, Window, Ceiling or Roof Fans, With a Self-contained Electric Motor of an Output Not Exceeding 125 W; and subheading 8414.60, Hoods Having a Maximum Horizontal Side Not Exceeding 120 cm. Other detail recognizes other important distinctions including those between fans and compressors and between refrigeration and other compressors.

In interpreting the system, the analyst must first take into account the legal notes as well as the texts as specified by the General Rules for Interpretation of the Harmonized System. As a valuable aid to

knowing the system, there are also Explanatory Notes for each Chapter, heading, and, in some cases, subheading. These Explanatory Notes do not have legal status, but do represent a consensus that countries using the HS have reached on interpreting the system and are particularly useful to those who do not have detailed familiarity with the HS.

However, the legal texts may seem incomprehensible to non-specialists and may only approximate the precise statistical distinction that is wanted. For example, subheading 8469.21 specifies certain typewriters “weighing not more than 12 kg, excluding case” and subheading 8470.10 covers “electronic calculators capable of operation without an external source of power.” Both cover machines that are primarily for personal use and are commonly referred to as portable.

In other chapters such as Chapter 72, Iron and Steel, the products are listed in great detail because the products in this chapter such as plate, sheet, strip and wire, have different meanings for different countries. The products are defined in the HS by such objective characteristics as width, thickness, and shape, and whether or not they are shipped in coils; thus, one needs to have a great deal of knowledge about steel products to understand the product groupings.

2. Central Product Classification, Version 1

The Central Product Classification (CPC), Version 1 system of the United Nations document is excerpted here.²⁰ Its main purposes include:

[providing] a framework for the international comparison of statistics dealing with goods, services and assets and to serve as a guide for developing or revising existing classification schemes of products in order to make them compatible with international standards. CPC was developed primarily to enhance harmonization among various fields of economic and related statistics and to strengthen the role of national accounts as an instrument for the coordination of economic statistics.

CPC constitutes a comprehensive classification of all goods and services. With regard to services, no international classification covering the whole spectrum of outputs of the various service industries and serving the different analytical needs of statistical and other users was available before the development of CPC. As a general-purpose classification, CPC provides less detail than other specific classification systems in areas or applications for which such systems are available, for example HS for internationally commodity trade statistics.

CPC includes categories for all products that can be the object of domestic or international transactions or that can be entered into stocks. It presents products that are an output of economic activity, including transportable goods, non-transportable goods and instruments providing ownership over intangible assets, such as patents, licences, trademarks and copyrights. Although non-produced assets are not regarded as products in the System of National Accounts, they are included in the balance sheet.

CPC, as a standard central product classification, was developed to serve as an instrument for assembling and tabulating all kinds of statistics requiring product detail. Such statistics may cover production, intermediate and final consumption,

capital formation, foreign trade or prices. They may refer to commodity flows, stocks or balances and may be compiled in the context of input-output tables, balance of payments and other analytical presentations.

CPC, covering all goods and services as well as certain types of assets, is a system of categories that are both exhaustive and mutually exclusive. This means that if a product does not fit into a CPC category, it must automatically fit into another category. Consistent with the other principles used, homogeneity within categories is maximized. CPC classifies products into categories based on the physical properties and the intrinsic nature of the products as well as the principle of industrial origin.

Each subclass in sections 0 to 4 of CPC is defined as the equivalent of one or the aggregation of several headings or subheadings of the Harmonized Commodity Description and Coding System (HS), a classification of the World Customs Organization.

The physical properties and intrinsic nature of products are distinguishing characteristics that are proper to the products themselves. These include, for example, the raw materials of which goods are made, the stage of production or the way in which goods are produced or services rendered, the purpose or user category for which products are intended and the prices at which they are sold.

In the construction of CPC, both criteria (i.e., the nature of the product and the industry of origin) were taken into account. However, practical difficulties had to be resolved. Some industries produce goods of very different nature. For example, meat and hides are both produced by slaughterhouses. These products are not put together in one category or even in the same section of CPC.

In some cases, goods of different industrial origin are included in a single CPC category particularly where HS does not follow the industrial origin criterion. For instance, rarely does HS distinguish between metal products of cast iron and other metal products.

Among the variety of criteria generally used for distinguishing between goods and services (tangible versus intangible, storable versus non-storable or transportable versus non-transportable), none provides a valid, practical and unambiguous distinctions between goods and services in all cases. While the product content of most CPC subclasses can be identified as being goods or services, in some cases this cannot be resolved easily.

Although a precise distinction between goods and services may be interesting from a theoretical point of view and may even be relevant for the compilation and analysis of certain economic statistics, there is no need to embody such a distinction into a classification of products such as CPC. CPC was developed to classify everything that can be the object of a transaction, covering goods and services (products), certain produced assets and even non-produced assets such as land.

The 1993 SNA provides a definition of products. It states that goods and services (products) are the result of production; they are exchanged and used for various purposes - as inputs in the production of other goods and services, as final consumption or for investment. In the 1993 SNA the term products is a synonym for goods and services. In order to study transactions in goods and services in detail SNA uses the Central Product Classification.

For international trade statistics, the 1993 SNA also encompasses the concepts of goods and services, rather than the concepts of merchandise and non-merchandise trade as described in the previous SNA. This further enhances the conceptual integrity of CPC.

The coding system of CPC is hierarchical and purely decimal. The classification consists of sections (identified by the first digit), divisions (identified by the first and second digits), groups (identified by the three digits), classes (identified by the first four digits) and subclasses (identified by all five digits, taken together). The codes for the sections range from 0 to 9 and each section may be divided into nine divisions. [T]here are 10 sections, 71 divisions, 294 groups, 1,162 classes and 2,093 subclasses. The code numbers in the CPC consist of five digits without separation of any kind between digits. This coding system was chosen to avoid possible confusion with code numbers of another United Nations classification, the Standard International Trade Classification, which also has five-digit codes but uses a point to the right of the third digit.

HS is an exhaustive nomenclature of internationally traded commodities (goods) classified according to the following criteria: classification according to raw or basic material, classification according to the degree of processing, classification by use or function and classification according to economic activities. [The WCO] also agreed, in principle, to introduce industrial origin criterion in the construction of HS. However, the principle that each subheading of HS should contain only goods that are normally produced by a single industry could not be strictly followed for various reasons.

The relationship between CPC and SITC is similar to that between CPC and HS because SITC Rev.3 also used the HS subheadings as building blocks to create commodity groupings that are more suitable for the economic analysis of trade.²¹

The intent here is to generate a general framework for international linkage, i.e., between the SITC and the ISIC, and comparisons of data from various types of systems such as commodity flows and the national accounts or for comparing domestic output and external trade. In particular, it can provide guidelines for collecting detail needed on domestic production of goods and services. The CPC exists even though we have the HS and SITC because: (1) the CPC includes services; (2) it is intended as a vehicle for production statistics rather than trade, and; (3) it provides for less detail than the HS or SITC to meet its objective of providing comparability of statistics dealing with goods, services, and assets. The CPC provides a 5-digit hierarchical product classification system including 2093 subclasses at the greatest detail. Countries may use the CPC as is or as a framework for developing its own system for collection of product statistics. The CPC provides for less detail than the HS, but yet allows for a direct link to the tradeable goods statistics. The general structure of the CPC is much like that of ISIC, with many minor

differences and one major one. The major difference is that service activities that are classified as agriculture, mining, or manufacturing in the ISIC activity classification are grouped with services in the CPC code structure. Some of the other differences result from the inclusion in the CPC of categories that are not uniquely related to specific activity groupings, such as: (1) provision for a division for waste and scrap; (2) provision for Division 52, Constructions and Division 53, Land, both as assets; and (3) provision for Division 89, Intangible Assets.

The CPC combines the main classification principles of ISIC and HS/SITC. The broad levels are largely tied to activity groupings and the principal industry of origin -- as in ISIC. The detail, however, is tied to classification according to characteristics of the product, as in HS/SITC. Each CPC consists of the goods of one or more complete HS and covers goods falling within a single 3-digit SITC. The CPC or SITC or both were modified to achieve this. Each CPC also goes to a single ISIC, to the extent feasible and to the extent permitted by the HS detail. However, products of a given ISIC may be scattered in the CPC to group like products together. Thus products found together in ISIC 1511, Production, Processing, and Preserving of Meat and Meat Products, appear in a range of CPC areas as hides and skins in CPC code 02971, meat in product grouping 211, and fats and oils in code 21611. This arrangement of products is similar to the SITC arrangement.

The link among ISIC, CPC, and SITC is not always possible. In describing ISIC, industries were mentioned where the ISIC detail could not -- or at least did not -- reflect the HS detail. These included ISIC categories that: (1) are defined by the manufacturing process such as metal forging and stamping where the products are widely scattered in HS, and (2) produce identical products using different input combinations, such as the manufacture of certain textiles and the manufacture of knit wearing apparel. In the CPC, identical products for these different activities can be associated with only one activity category. In most of these situations, however, the CPC relationship will include no reference to at least one ISIC, or at best very incomplete references. For example, in ISIC, apparel that is knit from yarn is included in ISIC category 1730, manufacture of knitted and crocheted fabrics and articles, whereas knit apparel that is made in a cut and sew shop is in ISIC category 1810, manufacture of wearing apparel, except fur apparel. In the CPC, knitted wearing apparel is included in Division 28, knitted or crocheted fabrics; wearing apparel, class 2822, wearing apparel, knitted or crocheted. The ISIC reference is to ISIC category 1810 with no mention or link to ISIC category 1730.

The complete CPC system for nontransportable goods and services is new and unique at the international level. Because services are not covered by HS or SITC, there are no problems of linkages to these systems, but there is general agreement that the product detail for services in the CPC needs to be extended. To aid in interpreting the detail of the CPC, the United Nations has drafted explanatory notes to define the scope of the categories. The following table presents the correspondence between the CPC Ver. 1.0 Division, Group, Class and Subclass structure with that of the ISIC, HS, and SITC.

Table 3

CPC VERSION 1.0: DETAILED STRUCTURE AND CORRESPONDENCE						
Division 26 YARN AND THREAD; WOVEN AND TUFTED TEXTILE FABRICS						
				Corresponding		
Group	Class	Subclass	Title	HS	SITC	ISIC
266	Woven fabrics (except special fabrics) of cotton					1711
	2661	26610	Woven fabrics of cotton, containing 85% or more by weight of cotton, weighing not more than 200 g/m ²	5208	652.21, 652.3*	
	2662	26620	Woven fabrics of cotton, containing 85% or more by weight of cotton, weighing not more than 200 g/m ²	5209	652.22, 652.4*	
	2663	26630	Woven fabrics of cotton, containing 85% or more by weight of cotton, mixed mainly or solely with man-made fibres	5210, 5211	652.23, 652.24*, 652.5*, 652.6	
	2669	26690	Other woven fabrics of cotton	5212	652.25, 652.26, 652.9	

* denotes part

Source: CPC Version 1.0, Statistical Papers, Series M No. 77, Ver.1.0, UN: New York, 1998, Table, p. 49.

3. Standard International Trade Classification, Revision 3

The Standard International Trade Classification (SITC), Revision 3, administered by the United Nations, is a statistical classification designed and used for analyzing data on international trade (SITC, Rev. 3, came into effect in 1986.)²² Unlike the HS which is an administrative system for collecting trade data, the SITC is purportedly designed to serve as an analytical system tool, and consists of 3118 detailed 5-digit categories arranged in a hierarchical structure, which is in turn, composed of nine sections with a number of divisions within each section that further defines the detail. For example, Section 0, Food and Live Animals, contains 10 divisions, having of such groupings as live animals (division 00), meat and meat preparations (division 01), and feeding stuff for animals (division 08). With one exception, the SITC utilizes the HS detail, but places the detail in a different arrangement which is more suitable for broad trade analysis. For example, SITC category 711.11 Steam or Other Vapor Generating Boilers aggregates three HS codes related to steam or other vapor generating boilers, which are 8402.11, Watertube boilers with a steam production exceeding 45 t per hour; 8402.12, Watertube boilers with a steam production not exceeding 45 t per hour, and 8402.19, Other vapor generating boilers, including hybrid boilers. Likewise, the earlier example of HS 5208.11 is combined with HS codes 5208.12, 5208.13, and 5208.19 to form SITC code 652.21, Woven fabrics containing 85% or more weight of cotton, unbleached, weighing not more than 200 grams per square meter.

The one exception mentioned earlier is petroleum and petroleum products. The countries of the world could not decide on the HS detail for petroleum products so HS 2710 covering petroleum and

petroleum products is not subdivided. SITC, Rev.3, however, retained the subdivisions used for Rev. 2, even though there was no comparable detail in the HS. As an analytical system, the SITC's broad structure emphasizes level or stage of processing and market categories (e.g., raw materials, intermediate goods, capital goods, final consumer products, other final products).

A clear illustration as to how the HS and SITC differ is found in textile fibers, yarn, fabric, and articles. HS Chapter 52, Cotton, is cotton from processing the fiber to spinning the yarn to the final woven fabric. HS Chapters 50, 51, and 53-55 do the same for other fibers, such as wool, silk, manmade filaments and so forth. HS Chapters 56-63 cover other textile fabrics and final textile goods, including apparel, carpet, and other articles. These same products, however, are widely separated in the classification scheme of the SITC, with Division 26 of Section 2, Crude materials, inedible, except fuels covering raw cotton; Division 65, of Section 6, Manufactured goods classified chiefly by material, covering yarn, fabric, and some articles; and Division 84 of Section 8, Miscellaneous manufactured articles, covering apparel. These groupings match a split of raw materials, intermediate goods, and final products. This rearrangement of HS products into market categories for the SITC is limited, however, by at least two elements: heavy emphasis of the SITC on historical comparability which limited the movement of some new HS detail to a more appropriate broad market category and the fact that the original HS does not always provide separately for goods of different markets. For example, parts are not always recognized separately in the HS.

Table 4

SITC, Rev. 3		
652.2 Cotton fabrics, woven, unbleached (other than gauze and pile and chenille fabrics)		
SITC subgroup	Description	6-digit HS
652.21	Woven fabrics containing 85% or more by weight of cotton, unbleached weighing not more than 200 g/m ²	5208.11*, 5208.19
652.22	Woven fabrics containing 85% or more by weight of cotton, unbleached weighing more than 200 g/m ²	5209.11*, 5209.19
652.23	Woven fabrics containing less than 85% by weight of cotton, unbleached, mixed mainly or solely with man-made fibres, weighing not more than 200 g/m ²	5210.11*, 5210.19
652.24	Woven fabrics containing less than 85% by weight of cotton, unbleached, mixed mainly or solely with man-made fibres, weighing more than 200 g/m ²	5211.11*, 5211.19
652.25	Other woven fabrics of cotton, unbleached, weighing not more than 200 g/m ²	5212.11
652.26	Other woven fabrics of cotton, unbleached, weighing more than 200 g/m ²	5212.21
652.3	Other woven fabrics, containing 85% or more by weight of cotton, bleached, dyed, printed or otherwise finished, weighing not more than 200 g/m ²	5208.21*, 5208.29, 5208.31*, 5208.39, 5208.41*, 5208.49, 5208.51*, 5208.59
652.4	Other woven fabrics, containing 85% or more by weight of cotton, bleached, dyed, printed or otherwise finished, weighing more than 200 g/m ²	5209.21*, 5209.29, 5209.31*, 5209.39, 5209.41, 5209.43, 5209.49, 5209.51*, 5209.59
652.5	Other woven cotton fabrics, containing less than 85% by weight of cotton, mixed mainly or solely with man-made fibres, bleached, dyed, printed or otherwise finished, weighing not more than 200 g/m ²	5210.21*, 5210.29, 5210.31*, 5210.39, 5210.41*, 5210.49, 5210.51*, 5210.59
652.6	Other woven cotton fabrics, containing less than 85% by weight of cotton, mixed mainly or solely with man-made fibres, bleached, dyed, printed or otherwise finished, weighing more than 200 g/m ²	5211.21*, 5211.29, 5211.31*, 5211.39, 5211.42, 5211.41, 5211.43, 5211.49, 5211.51*, 5211.59
652.9	Other woven fabrics of cotton	5121.12, 5212.13, 5212.14, 5212.15, 5212.22, 5212.23, 5212.24, 5212.25

* denotes part

Source: Standard International Trade Classification Revision 3, Statistical Papers Series M No. 34/Rev 3

4. International Standard Industrial Classification of All Economic Activities, Revision 3

The International Standard Industrial Classification of All Economic Activities (ISIC), Revision 3 (Rev. 3) was developed by the United Nations (UN) to serve as a standard for countries to adopt, either in total or with modifications,²³ and, it is meant to serve as a basis for comparisons among countries which may be compiling data of different national statistical systems. ISIC, Rev. 3, was approved by the Statistical Commission in 1989, and in recent years the ISIC has been more influenced by countries other than the United States; and ISIC, Rev. 3, is more detailed than the earlier revisions.

The introduction to ISIC, Rev. 3, contains a discussion of an “activity.” Although this, and the name of the classification itself, might suggest a conceptual framework on an industry basis, there appears to be no single theoretical aggregation concept embodied in it; that is to say, ISIC is not constructed on a single conceptual basis, but is based neither upon a production-oriented concept, as is done in the NAICS, nor on a “commodity-oriented” concept. This results, in part, from the role of the ISIC in permitting comparisons among country systems as they actually exist. Individual country industry classification systems are generally oriented toward program administration rather than toward theoretical economic analysis or data uses, resulting in a mixture of concepts underlying the framework. The ISIC is intended to be a standard classification of productive economic activities and the system is used for classifying different statistical units (including enterprises, companies, or establishments).

ISIC does not use the word industries in its statement of organizing principles, but rather refers to its 4-digit groupings as categories. The system is based on a 2-, 3-, and 4-digit hierarchical structure. The 2-, 3-, and 4-digit groupings allow countries that wish to base their industry system on the international standard the opportunity to aggregate to broader levels or to further subdivide the groupings to meet their statistical needs and better reflect the economic activity of the country. It also provides those countries with existing detailed industry classification systems a better means for mapping the detail of their systems to the ISIC for international comparability.

The ISIC places emphasis on classifying according to the final product such that units that produce the same final product, regardless of the manufacturing process are generally classified together. The result of this classification philosophy is that a product can be produced by only one 4-digit ISIC category (industry). That conceptual basis for aggregation accords to the “product” classification philosophy not to an “industry” classification one.

Table 5

ISIC, Rev. 3				
ISIC 1711, Preparation and spinning of textile fibres; weaving of textiles				
ISIC	SIC (1987)		NAICS (1997)	
1711	2211	Broadwoven Fabric Mills, Cotton	31321*	Broadwoven Fabric Mills
	2221	Broadwoven Fabric Mills, Manmade Fiber and Silk		
	2231*	Broadwoven Fabric Mills, Wool (Including Dyeing and Finishing) - <i>Weaving of fabric</i>		
	2281	Yarn Spinning Mills	313111*	Yarn Spinning Mills
	2282	Yarn Texturizing, Throwing, Twisting, and Winding Mills	313112	Yarn Texturing, Throwing, and Twisting Mills
	2284	Thread Mills		
		Except Finishing	313113*	Thread Mills
		Finishing	313312*	Textile and Fabric Finishing (except Broadwoven Fabric) Mills
	2299*	Textile Goods, n.e.c. - <i>Processing of fibers other than cotton, manmade, silk, and wool; and further production of yarns and fabric</i>	31321*	Broadwoven Fabric Mills
			31311*	Fiber, Yarn, and Thread Mills
			Textile and Fabric Finishing Mills	
3999*	Manufacturing Industries, n.e.c. - <i>Processing coarse animal hair</i>	31331*	Textile and Fabric Finishing Mills	

* denotes part

Furthermore, the ambiguity of containing the word “industry” in the name ISIC is evidenced in that one objective of Rev. 3 was to promote harmonization among different international systems, such as the Harmonized System, to permit improved analysis. Therefore, ISIC, Rev. 3, actually presents a mixture of “industry” and “product” aggregations of economic activities. An early decision in the development of ISIC, Rev. 3, was to define categories for transportable goods largely in terms of HS classes as a way to provide maximum convertibility among the detail of the different international systems. ISIC, Rev. 3, thus attempts to define transportable goods industries by the HS products made by the reporting unit. In this respect, then the ISIC might be characterized as primarily a demand-side or commodity-oriented system. For example, in the ISIC, the gathering of wild mushrooms is placed with the farming of mushrooms. Likewise, the manufacture of all coal briquettes is defined into mining in the ISIC, regardless of the production process and even if the unit producing briquettes does no mining. Thus the treatment of coal

briquettes reflects the intent of ISIC to define transportable goods categories in terms of products and to include the same product in only one category. Likewise, canning, freezing, drying, and preserving of fruits and vegetables are all included in one industry in the ISIC. Thus, this ISIC treatment of products illustrates the conflict between the emphasis on the product and the emphasis on process. (NAICS similarly includes Frozen Food Manufacturing, 31141, and Fruit and Vegetable Canning, Pickling, and Drying, 31142, in the 4-digit grouping 3114, Fruit and Vegetable Preserving and Speciality Food Manufacturing. The conceptual framework of NAICS for U.S. industries becomes evident at the 6-digit level, e.g., 311411, Frozen Fruit, Juice, and Vegetable Manufacturing; 311412, Frozen Specialty Food Manufacturing; 311421, Fruit and Vegetable Canning; 311422, Specialty Canning; and, 311423, Dried and Dehydrated Food Manufacturing.)

The ISIC, Rev. 3, is, however, not a pure demand-side system. In many cases, the ISIC, like the NAICS, has elected to recognize the combination of activities that actually occur together in the economy, or at least are currently accepted together in national systems. These aggregations generally reflect differences in production patterns or principles, such as joint production or differences in vertical integration. For example, ISIC category 1511, Production, Processing, and Preserving of Meat and Meat Products, includes hides, skins, and animal fats, in addition to meat products. Hides, skins, and animal fats are included in ISIC category 1511 because they are the result of the production process of slaughtering. ISIC category 1511 then includes all of the products of the meat slaughtering process, allowing individual countries to separate these categories by production process if wanted. In other cases, distinctions in ISIC are based on vertical integration of the plants. ISIC, Rev. 3, recognizes as separate 4-digit industries those plants which finish purchased broadwoven fabrics versus those that weave the fabric and finish it in the same plant.

For some ISIC categories, the link to the HS is unclear. ISIC category 2423, Manufacture of Pharmaceuticals, Medicinal Chemicals and Botanical Products, specifies the inclusion of “chemical substances used in the manufacture of pharmaceuticals.” The HS provides separately for some of these chemical substances, but not all. To provide a direct link to the HS, some countries may argue that the scope of ISIC 2423 should be limited to those substances separately identified in the HS.

While the general objective of ISIC, Rev. 3, was to define each ISIC by one or more HS categories, the above examples illustrate that this principle was not followed universally. Rather, in some cases, ISIC recognizes joint production and vertical integration, a supply side (or production-oriented) concept, which results in the same product being defined in more than one industry. In other cases, the link between ISIC and HS is not clear. The ISIC categories for nontransportable goods also represent a mixture of supply- and demand-side characteristics, and thus do not reflect a single concept; many ISIC industries are defined solely in terms of demand or services performed. Thus, for example, ISIC category 9301, Washing and drycleaning of textile and fur products, includes all washing and drycleaning activities. Only one industry covers all types of drycleaning activity, from coin-operated laundromats to industrial laundries. The NAICS, on the other hand, separates washing and drycleaning activities by type, a supply-side concept, as shown below.

Table 6

ISIC, Rev. 3			
ISIC 9301, Washing and Drycleaning Activities			
ISIC		NAICS (1997)	
9301	Washing and (dry-) cleaning of textile and fur products	81231	Coin-operated laundries and drycleaners
		81232	Power laundries, garment pressing, and agents for laundries, drycleaning plants, except rug cleaning, industrial launderers, drycleaning and laundry services, except coin-operated
		81233	Linen and uniform supply
		81149	Other personal and household goods
		56174	Carpet and upholstery cleaning

The treatment depicted in table 7 by ISIC reflects the objective that a product or service is included in one industry only. Some of the new features of ISIC raise the question of whether it is desirable to group together industries that are providing the same kinds of services, regardless of the customer or market served. Previously in the ISIC some rental and leasing activities were classified according to the market served, but ISIC, Rev. 3, brings together virtually all rental and leasing into a separate division. For example, ISIC, Rev. 3, Division 71 is “Renting of Machinery and Equipment Without Operator and of Personal and Household Goods.” Eight separate industries are recognized within that division: renting of land transport equipment; renting of water transport equipment; renting of air transport equipment; renting of agricultural machinery and equipment; renting of construction and civil and engineering machinery and equipment; renting of office machinery and equipment, including computers; renting of other machinery and equipment, n.e.c.; and renting of personal and household goods, n.e.c.

In NAICS rental of equipment is classified into the 532 Rental and Leasing Services subsector. For example, this 3-digit subsector includes four industry groups: 5321 is Automotive Equipment Rental and Leasing; 5322 is Consumer Goods Rental; 5323 is General Rental Centers; and 5324 is Commercial and Industrial Machinery and Equipment Rental and Leasing. These industry groups were placed in NAICS 532 so as to address a perceived inconsistency in the 1987 U.S. Standard Industrial Classification (SIC) system groupings, which were examined during the NAICS revision process. That review determined that rental and leasing services should be grouped together, as they are in most other classification systems.

Countries utilize the ISIC in either of two ways. First a country may use the ISIC itself or a system based directly on the ISIC, with aggregations or subdivisions determined nationally. The European Union's NACE is an example of a system based on the ISIC.²⁴ NACE has been subdivided to provide for additional industries. The second use of the ISIC is to link data for countries which utilize a system that is

structured and numbered differently from the ISIC. Data are then reaggregated to allow for international comparisons.

B. U.S. Classifications

1. Harmonized Tariff Schedule of the United States Annotated and Statistical Classification of Domestic and Foreign Commodities Exported from the United States

For transportable goods, the U.S. collects import trade data using the Harmonized Tariff Schedule of the United States Annotated (HTS) and export trade data using the Statistical Classification of Domestic and Foreign Commodities Exported for the United States (Schedule B) classifications.²⁵ Both of these classifications are HS-based national systems extant in sufficient detail for use in the CPC. In the United States, however, output data are collected in the economic census using the 7-digit product code (see section below) and those data have been subdivided for comparability to the HS where feasible, but this provision allows for only partial convertibility to the CPC, SITC, and HS. Over the past several years, however, the United States has been attempting to incorporate comparability to the HS by changing or extending the detail collected within the industry framework. This has not been completely successful because of various factors, including:

- o Basic conflicts in approach between the product framework of the HS and the information available from U.S. companies on products produced. U.S. companies and trade associations generally prefer the market-based approach of the current U.S. product categories.
- o Excessive detail in the HS, significantly increasing respondent burden if adopted by the U.S.
- o Problems in disclosing information for individual companies if the HS detail were collected.

Most countries that use the HS subdivide the detail further to meet their own requirements, and this is true in the U.S. HTS and Schedule B classifications, wherein both systems have the same general appearance and numbering and consist of 10 digit codes. Wherever an import code and its corresponding export code share the same scope, their 10-digit code should be identical. As explained earlier, the 10 digit codes consist of the 6-digit HS plus two digits for legal requirements and two digits for statistical use.²⁶ There are about 15,000 categories in the HTS and 8,000 in Schedule B.

The additional detail collected in import and export schedules varies greatly among countries, partly because of tariff and related requirements and partly because of the importance of different products. The example shown earlier for the U.S. detail for cotton fabrics in its tariff schedule is a good illustration. Below on the left is the 10-digit detail developed by the U.S. for HS Code 5208.11. On the right is the detail used by EUROSTAT in its Combined Nomenclature (CN) extension of the same HS code.

Table 7

HTS CODE 5208.11, Woven fabrics of cotton, containing 85% or more by weight of cotton, weighing not more than 200 g/m², unbleached, plain weave, weighing not more than 100 g/m²					
United States HTS (10-digit)				EUROSTAT CN (10-digit)	
Heading/ Subheading	Stat. Suffix			Heading/ Subheading	
5208.11.20		Of number 42 or lower		5208 11 10	Fabrics for manufacture of bandages dressings and medical gauzes
	20		Poplin or broadcloth	5308 11 90	Other
	40		Sheeting		
	90		Cheesecloth		
5208.11.40		Of number 43 - 68			
	20		Poplin or broadcloth		
	40		Sheeting		
	60		Printcloth		
	90		Cheesecloth		
5208.11.60	00	Of number 69 or higher: Suitable for making typewriter ribbon			
5208.11.80		Other			
	20		Poplin or broadcloth		
	90		Cheesecloth; lawns, voiles or batistes		

For the 6-digit subheading 5208.11 there are 141 U.S. 10-digit HTS codes. These HTS codes relate to only a portion of the goods produced in SIC 2211, Broadwoven Fabric Mills, Cotton. In addition, SIC 2211 includes 69 10-digit HTS codes for products in HS 5209, 85 HTS in HS 5210, 60 HTS in HS 5211, 93 HTS in HS 5212, 10 HTS in HS 5801, 3 HTS in HS 5802, and one HTS in HS 5803. There are a total of 462 10-digit HTS codes that concord to 19 7-digit products in the Numerical List of Manufactured and Mineral Products for SIC 2211.

2. Numerical List of Manufactured and Mineral Products and Current Industrial Reports Product Detail

The coding scheme for the Standard Industrial Classification (SIC)-based product codes is the primary industry-of-origin of the good or service, and these product data are reported in only the industry of primary production, i.e., attributed to a single SIC industry, regardless of the actual industry in which the particular good or service is produced. The 7-digit coding in the Numerical List represents a grouping of the primary products in each 4-digit SIC industry. The Bureau of the Census produces its numerical list of manufactured and mineral products for the 1992 quinquennial *Census of Manufactures* which comprised more than 6,300 products, and, in addition, identified over 4,500 products for which information is collected at more frequent intervals, e.g., monthly, quarterly, and annually, in the Current Industrial Reports (CIR) program.

While this numerical list classification predominantly uses the industry of origin concept as its structure, products which are exceptions are identified in Appendix G of the *1992 Census of Manufactures*.²⁷ For the *1997 Census of Manufactures*, the 7-digit SIC numerical list was used in data collection, but those codes have been converted to a 10-digit NAICS code for publication.

The Census Numerical List of Manufactured and Mineral Products

includes the principal products and services of the manufacturing and mining industries in the United States. Each product or service is assigned a seven-digit code. The product coding structure represents an extension, by the Bureau of the Census, of the four-digit industrial classification of the manufacturing and mining industries as defined in the Standard Industrial Classification (SIC) System. The SIC ... classifies establishments to the four-digit industry level by their primary type of activity. The classification system operates so that the industrial coverage is progressively narrower with the successive addition of digits. This is illustrated as follows:²⁸

Table 8

1992 SIC and NAICS 1997 - Numerical List of Manufactured and Mineral Products					
Major Group 22, TEXTILE MILL PRODUCTS					
SIC Industry Group	SIC Industry	SIC Product Class	SIC Product Code	NAICS (1997) Product Code	Industry and product description
221	2211			313210W*	BROADWOVEN FABRIC MILLS, COTTON
		2211B	2211B00	3132101100	PLAIN WEAVE FABRICS, EXCEPT PILE (GRAY GOODS)
		2211C	2211C00	3132103100	TWILL WEAVE FABRICS, EXCEPT PILE (GRAY GOODS)
		2211D	2211D00	3132105100	ALL OTHER WEAVES, EXCEPT PILE (GRAY GOODS)
		2211E	2211E00	3132107100	PILE FABRICS (GRAY GOODS)
		2211F		3132109	FINISHED COTTON BROADWOVEN FABRICS (FINISHED IN WEAVING MILLS)
			2211F01	3132109111	Plain weave, except pile: Print cloth (finished)
			2211F03	3132109121	Plain weave, except pile: Poplin and broadcloth (finished)
			2211F05	3132109131	Plain weave, except pile: Sheeting, including bedsheeting and canaburgs (finished)
			2211F07	3132109141	Plain weave, except pile: Tobacco, cheese, and bandage cloth (finished)
			2211F09	3132109151*	Plain weave, except pile: Duck (finished)
			2211F11	3132109151*	Plain weave, except pile: Other, including lawns, voiles, and battistes (finished)
			2211F13	3132109161	Twill weave except pile (finished)
			2211F15	3132109171*	Other weaves, except pile: Sateens (finished)
			2211F19	3132109171*	Plain weave, except pile: Other, including oxfords, table damask, jacquard, dobby shirting, and birdseye diaper cloth (finished)
			2211F23	3132109181	Pile fabrics (velvets, plushes, corduroy, terry toweling, terry cloth, and others)
		2211G		313210B	COTTON TOWELS AND WASHCLOTHS (MADE IN WEAVING MILLS)
			2211G10	313210B110	Terry, including pile
			2211G30	313210B120	Huck, and crash towels
		2211H		313210C	FABRICATED COTTON TEXTILE PRODUCTS, EXCEPT TOWELS AND WASHCLOTHS (MADE IN WEAVING MILLS)
			2211H01	313210C120*	Quilted: Bedspreads, chiefly cotton (made in weaving mills)
				313210C130*	Quilted: Comforters and quilts, chiefly cotton (made in weaving mills)
				313210C141*	Quilted: Other fabricated cotton textile products, made in weaving mills
			2211H03	313210C120*	Nonquilted: Bedspreads, chiefly cotton (made in weaving mills)
				313210C130*	Nonquilted: Comforters and quilts, chiefly cotton (made in weaving mills)
				313210C141*	Nonquilted: Other fabricated cotton textile products, made in weaving mills
			2211H25	313210C110	Sheets and pillowcases

* denotes part

As Carole Ambler, Chairman of the ECPC notes:

The product codes are linked to the industry system regardless of the use or demand of the product.²⁹

For the Current Industrial Reports (CIR) periodic surveys

[w]here product detail is available, the census report requests only broad aggregates that can be “tied in” with the product detail in the CIR program. The product detail that is collected monthly, quarterly, or annually in the CIR is not duplicated in the census of manufactures. Instead a single (teline) code is collected in the census that corresponds to the sum of the detail appearing if the CIR is used.³⁰

Thus, these Census product classifications adhere to the industry of origin concept. The classifications generally represent a one-to-one mapping of products to industry of primary origin.

3. Producer Price Index Product Lines

The Bureau of Labor Statistics (BLS) Producer Price Index (PPI) codes are also industry of origin codes of the product (good or service).

An industry consists of a group of establishments primarily engaged in producing or handling the same product or group of products or in rendering the same services. Industry definitions used in the PPI come from the 1987 *Standard Industrial Classification (SIC) Manual*. Because the SIC is used by many other federal government statistical programs, it is possible for users to assemble a comprehensive statistical picture of an industry.

PPIs are available for the outputs of over 500 industries (4-digit SICs). Virtually all mining and manufacturing industries are covered. Coverage of service industries is gradually increasing. As of January 1997, the PPI covers industries accounting for approximately 35 percent of the outputs of the service sector. Service industry coverage is scheduled to grow substantially through the year 2002.³¹

The PPI is explicitly constructed so as to be able to identify industry output and establish a price index for that output. Irwin Gerduk states:

Prior to the program expansion into services, which began in the 1980's, the PPI was a measure of price change for the goods producing sectors of the economy. The program relied almost entirely on the Census of Manufactures and the Census of Mineral Industries for product line definitions and weights. Similar information was not available in the various Economic Censuses covering the non-goods producing sectors. Therefore, the PPI program was obliged to create its own product line definitions. We also had to secure reliable revenue data for index weighting. This process, conducted for several score service industries to date, has given us some useful insights into the issues involved in creating meaningful product line detail in a supply-based classification structure.

We consider a service to be a bundle of goods and labor activities provided to a customer to accomplish a given function and the service must be consumed at the time it is provided. Both the provider of the service and the consumer of the service must agree on the basic goal of the activity. Goods are physical products provided to the customer for future use. Goods are not consumed when purchased and do not involve a labor activity supplied by the producer when ultimately consumed.

As the PPI by definition measures output price change, we needed to find a conceptual system that determined when a net or gross output concept applied. We adopted the Bureau of Economic Analysis' Input/Output concepts.

An industry index publication structure is a list of product lines and aggregations for which indexes will be calculated and published.

1. Logical rules -- Product lines must be defined to be mutually exclusive of each other. The sum of the product lines defined in an industry must equal the entire output of the industry. There must be no product produced in the industry which is not properly classifiable into one of the product lines in the structure. Product lines must aggregate in strict conformance to the hierarchical structure.
2. Industry terminology -- Product line titles must be understood by data user and conform to accepted usage.
3. Durability -- The product line definition should be viable for many years, thus allowing for time series analysis. The definition should accommodate the evolutionary change of products and services.
4. Economic significance -- The product line should reflect a significant share of industry revenue; the smaller the industry, the larger the revenue share should be.
5. Product line homogeneity -- Ideally, the product line definition would be homogeneous in conformance with the applicable primary classification concept. In an industry based system that would mean that services included in the product line would be more alike in inputs and output uses than services found in other product lines.³²

Table 9

Producer Price Index Product Lines SIC 2211 - Cotton Products of Broadwoven Fabrics Mills				
SIC Industry	PPI Product	PPI Product Class	PPI Product Line	Industry and product description
2211				Cotton broadwoven fabric
	2211-P			Primary products
		2211-A		Gray cotton broadwoven fabric
			2211-A1	Plainweave, except pile
			2211-A2	Twill weave, except pile
			2211-A3	All other weaves except pile
			2211-A4	Pile fabrics
		2211-B		Finished cotton broadwoven fabric
		2211-F		Cotton towels and washcloths
	2211-SM			Secondary products and miscellaneous receipts
		2211-S		Secondary products

Source: PPI Detailed Report (USPS 485-050) Data for August 1998, Bureau of Labor Statistics, U.S. Department of Labor, September 1998, p. 26.

Table [9] contains a sample of the PPI industry publication structure. This structure, which accounts for the entire output of the industry, defines the set of indexes BLS attempts to publish for the industry. For many industries, however, BLS is unable to publish all indexes in the structure due to nonresponse by sampled establishments and/or change in the composition of industry output since it was sampled for the PPI. Even though the more detailed product indexes may not be publishable, prices collected for those products are included in the indexes at the aggregate levels.

The publication structure for all industries contains indexes for primary products (those that represent the predominant set of outputs of establishments in the industry) and for secondary products and miscellaneous receipts (all other outputs not primary). Primary products are in turn broken down for every industry into 5-digit indexes for product classes, e.g., [2211-A] (partitions) in table [9] above]. Product class definitions used in the PPI come from the economic censuses of the U.S. Department of Commerce. Product class indexes within an industry publication structure may in turn be broken down into product line indexes if they represent a sizable share of industry revenue. As seen in table [9], one product

class ([2211-A]) is subdivided, and three are not.³³

4. Input-Output Commodity Classification System

The Bureau of Economic Analysis (BEA) constructs, and periodically updates, the U.S. Input-Output tables. The economic analysis technique of input-output (I-O) organizes production and output data so as to describe how factor inputs are transformed into outputs, i.e., production process to product and commodity outputs. In accomplishing this task, the construction of I-O tables requires appropriate definitions for industries and for products. The existing SIC reported data on industries and products are used in constructing the I-O “make” and “use” tables, but to do this BEA must resort to “redefining” and “reclassifying” input purchases and output sales receipts and moving products and services among the SIC-defined industries. These two tables are accounting matrixes: (1) the make table shows what industries produce; and, (2) the use table shows what industries buy, or use. Both tables as published consist of about 500 industries and 500 commodities. The working level table and data bases for the use table contains about 750 industries, 250 final use categories, and 7000-8000 commodities; or about 7000-8000 rows and 1000 columns. In addition, BEA makes estimates for purchaser value, producer value, and margins. The I-O tables are used to benchmark macroeconomic, GDP, accounts.

The processes of redefinition and reclassification are accomplished so as to increase industry homogeneity and to collect similar commodities together for the input-output table work.

The I-O accounts use two classification systems--one for industries and another for commodities--and both systems generally use the same I-O numbers and titles.

The I-O industry classification system.--This system is based on the Standard Industrial Classification (SIC) system, which classifies establishments into industries on the basis of the primary activities of the establishments. Establishments are defined as economic units that are typically at a single location where business is conducted or where services or industrial operations are performed.

The I-O industry classification system differs from the SIC system in three major ways. First, the I-O industry system redefines some secondary production of some SIC industries to other industries. Second, the I-O industry classification system includes ‘special industries’ that are not considered to be industries in the SIC system. Third, because of data limitations, the I-O industry system includes three industries--agriculture, construction, and real estate--that are defined on an activity basis rather than an establishment basis.³⁴

Reclassifying a particular SIC’s products entails taking the commodity output (product) which is primary to more than one SIC industry and combining those outputs together into a single industry. The process of reclassifying is illustrated in the example presented in table 10 below.

Table 10

Input-Output Commodity Classification System						
Reclassification of Commodity Output in SIC 2211 - Cotton Products of Broadwoven Fabrics Mills, to SIC and I-O Industries						
I-O Industry	I-O Industry Definition	SIC Industry	Product Code	Description of Commodity being Reclassified		
160100	Broad woven fabric mills and fabric finishing plants	2221*	2211A0, 2211ES, 2211IC	Miscellaneous receipt lines		
			2211B00	Plain weave fabrics, except pile (gray goods)		
			2211C00	Twill weave fabrics, except pile (gray goods)		
			2211D00	All other weaves, except pile (gray goods)		
			2211E00	Pile fabrics (gray goods)		
			2211F	FINISHED COTTON BROADWOVEN FABRICS (FINISHED IN WEAVING MILLS)		
			Plain weave, except pile:			
			2211F01	Print cloth (finished)		
			2211F03	Poplin and broadcloth (finished)		
			2211F05	Sheeting, including bedsheets and osnaburgs (finished)		
			2211F07	Tobacco, cheese, and bandage cloth (finished)		
			2211F09	Duck (finished)		
			2211F11	Other, including lawns, voiles, and bastistes (finished)		
			2211F13	Twill weave, except pile (finished)		
			Other weaves, except pile:			
			2211F15	Sateens (finished)		
			2211F19	Other, including oxfords, table damask, jacquard, dobby shirting, and birdseye diaper cloth (finished)		
2211F23	Pile fabrics (velvets, plushes corduroy, terry towelling, terry cloth and others)					
190200	Housefurnishings, n.e.c.	2392*	2211G	COTTON TOWELS AND WASHCLOTHS (MADE IN WEAVING MILLS)		
			2211G10	Terry, including pile		
			2211G30	Huck and crash towels		
			2211H	FABRICATED COTTON TEXTILE PRODUCTS, EXCEPT TOWELS AND WASHCLOTHS (MADE IN WEAVING MILLS)		
			2211H01	Quilted		
			2211H03	Nonquilted (except sheets and pillowcases)		
			2211H25	Sheets and pillowcases		

* denotes that the 7-digit SIC numerical product (commodity) codes listed represent only a portion of the reclassified commodities of the particular I-O industry shown; only those commodities in SIC 2211 that are being reclassified are listed in the table. The details for the other SIC commodities that were also reclassified into the two I-O industries described in the table are not shown in the table.

It is seen in table 10 that I-O industry 160100 includes SIC 2211 commodities which have been

reclassified to and are aggregated with SIC 2221, Broadwoven Fabric Mills, Manmade Fiber and Silk, data. That I-O industry also includes commodity data from several other SIC's, products which are deemed to be similar in consumption. Those other products being reclassified to I-O 160100 are from: SIC 2231, Broadwoven Fabric Mills, Wool (Including Dyeing and Finishing; SIC 2261, Finishers of Broadwoven Fabrics of Cotton; and SIC 2262, Finishers of Broadwoven Fabrics of Manmade Fiber and Silk. Table 10 depicts the reclassification and aggregation of commodities in SIC 2211 directly to SIC 2221 and SIC 2392 , i.e., as having been accomplished in a single step, although this was not the actual process.

The process is a multi step procedure. First, the basic commodity output information for each of the SIC industries 2211, Broadwoven Fabric Mills, Cotton, and 2221 is reclassified such that the reclassified data may be eventually assigned either to I-O industry 160100 or 190200. For example, towels and sheets, are reclassified to SIC 2392 so as to be include in I-O industry 190200. The remaining reclassified commodities from SIC 2211 and 2221 is to be included in I-O industry 160100. All of the reclassified data are aggregated with the commodity-level output from SIC's 2231, 2261, and 2262. Thus, through the process of reclassification and aggregation, BEA collects together products which are similar in consumption and which employ similar production techniques (regardless of the constituent material or the ownership of material inputs of those products) so as to form more homogeneous input-output sectors.

The process of redefining inputs and outputs is described below.

Redefinitions result in the shift of output and inputs related to the secondary activities of some establishments to the SIC industries in which they are primary activities. (A primary activity must make up the largest proportion of the establishment's output; all the other activities are secondary.) The I-O industry classification system only redefines the secondary activities of an SIC industry for which the related inputs are very different from those required for the industry's primary activity.

The I-O commodity classification system.--In this system, each commodity is assigned the code of the industry in which the commodity is the primary product. This code is then used to group production of the commodity in the industry in which it is the primary product with its production in other industries in which it is a secondary product. In a few cases, the I-O system reclassifies SIC-defined commodity groups, and a secondary product is created from a SIC-defined primary product. The output of the SIC-defined product is moved to the I-O defined primary product group; therefore, the output represents the total output of the product, regardless of the classification of the establishment that produce it. [Emphasis and italics in the original.]³⁵

C. Other Country Classifications

1. Standard Classification of Goods

The Standard Classification of Goods (SCG) is the classification standard developed by Statistics Canada to collect commodity data and to uniquely identify such data in data banks.³⁶ The SCG is an extension, by two digits, of the international Harmonized Commodity Description and Coding System, designed to meet Canadian requirements for extra detail for goods manufactured domestically, for materials used in their manufacture, and for goods that are imported or exported, since the SCG is based on the 6-digit HS, it provides for comparability to the HS.

The objective in developing the SCG was to add such levels of detail to Canadian product statistics, and Statistics Canada took special care in defining the classification in a way such that respondents could utilize normal business records for filing the data. The current, third, edition of the SCG covers the 1996 reference year. The SCG is intended as a standard for application to all commodity surveys conducted by Statistics Canada.

The SCG provides a structured list of goods, the classes being mutually exclusive, while collectively exhausting the universe of goods to be classified. It consists of a hierarchy of classes, with a different classification criterion applied at each level of the classification. Each class is identified by a code number, with the structure of the code indicating the level of the hierarchy. Although each class identified must have economic significance, the application of the principles of classification does not necessarily result in a similar degree of economic significance among categories at any given level of the hierarchy. Maintaining the stability of the SCG facilitates the comparison of data about goods, among different series for a given reference year or over time for any given series. On the other hand, to reflect changes in the economy and new requirements for statistics, the finest level of detail in the classification structure will be revised periodically.

At the two-, four- and six-digit level, the list of goods is exhaustive. The number of lowest-level codes thus obtained is 16,961.

A system of dashes is employed to clarify the hierarchy. Two dashes and four dashes have been assigned to six- and eight-digit subheadings, respectively. One dash or three dashes have been assigned to intermediate levels.³⁷

Table 11

STANDARD CLASSIFICATION OF GOODS 1996		
CODE		DESCRIPTION
52.08	SM	Woven fabrics of cotton, containing 85% or more by weight of cotton, weighing not more than 200 g/m²
		- Unbleached
	5208.11	E -- Plain weave, weighing not more than 100 g/m ²
	5208.11.1	--- Solely of cotton, weighing not more than 40 g/m ² ; solely of cotton yarns measuring per single yarn 60 decitex or less (exceeding 166.65 metric number per single yarn)
	5208.11.11	I ---- Gauze
	5208.11.19	I ---- Other
	5208.11.9	--- Other
	5208.11.91	I ---- Gauze
	5208.11.99	I ---- Other

Source: SCG 1996 Manual (computer printout, 17 DEC 98), Ottawa, Canada, 1998, p. 52 - 4.

The goods identified for each survey, i.e., imports, exports, material used, shipments, etc., necessarily reflect each universe surveyed and have been accommodated within one general classification which reflects the demand for data. The SCG represents a major step forward in developing a single product classification for both transportable goods and nontransportable goods, thereby reducing the reporting costs by eliminating duplicate classifications and the need for concordances by thus increasing the usefulness of the resulting data. However, the amount of detail required for businesses to report in the system has caused difficulties.

2. Australian and New Zealand Standard Commodity Classification

At the seventh meeting of the Voorburg Group on Service Statistics in October 1992, the Australian Bureau of Statistics (ABS) outlined a strategy for developing a CPC-based standard commodity classification with one objective being to improve the comparability of commodity level data across ABS statistical collections and, hopefully, with the statistics of other countries. Implementation of this program resulted in the Australian and New Zealand Standard Commodity Classification (ANZSCC). ANZSCC is aligned to the CPC at the 3-digit Group level. "Beyond the 3-digit Group level, ANZSCC categories are specified for up to three more levels (five, seven or nine digits). These categories may or may not align directly with the detailed level of the CPC. Where possible, the CPC categories were defined at the detailed (five digit) level or as splits of the detailed level."³⁸

The process of developing ANZSCC is ongoing. The ABS maintains other classifications, e.g.,

household expenditure survey, producer price indexes, input output classification, Australian Harmonized Export Commodity Classification (AHECC) 8-digit codes, etc., and alignments between these and the CPC are being investigated with a view to their improvement. “The ABS considers that taking active steps to improve alignment is strategically important. For example, the data provided by the service industry surveys is potentially valuable for household expenditure analyses and for price index development, the extent to which this value is realised depends directly on the compatibility of the respective commodity classification frameworks.”³⁹

3. Classification of Product by Activity

The European Union (EU) has developed the Classification of Product by Activity (CPA), a classification system covering both goods and services, that is based on the CPC and one which links directly to NACE. The CPA is a system developed by EUROSTAT for classifying products and services within the context of categories defined by NACE, Rev. 1.⁴⁰ It is a product classification whose elements are structured on the basis of the industrial origin criterion, industrial origin being defined by NACE Rev. 1. Each product is classified according to the activity that characteristically produces the product. For the most part, this CPA link to NACE is much like that used in the U.S. by the Census Bureau in its 1987 SIC-based 7-digit product codes. The CPA detail is based on the categories of the UN Central Product Classification, with some exceptions. For example, all CPC items are not products. Items such as non produced assets, including land which are in the CPC are not included in the CPA because they are not products and cannot be assigned to the industry of origin. There are six hierarchical levels within the CPA structure, with the first four levels identical to NACE. This results in a different hierarchical framework and coding system from that of the CPC.

4. Community Production

The EU also has developed Community Production (Prodcom), a listing of products for transportable goods. Prodcom is the title of the EU production statistics by the European Union. It covers mining and quarrying, manufacturing, and electricity, gas, and water supply. It is essentially a list of products that is based on the EC external trade statistics. Prodcom is divided into the same divisions as NACE, with each product assigned an 8 digit code. The first four digits of the code is the same as the NACE industries. The next two digits correspond to the CPA code and the last two normally provide a reference to the Combined Nomenclature, the EU's external trade nomenclature; each heading of the Prodcom list is defined by one or more headings of the external trade products. Prodcom serves as the collection vehicle for production statistics for the EU and provides a link to the other classification systems: those for industry, product, and external trade. Prodcom has in total 20 product lines for the CPA product 17.20.20. The following example, illustrates that link.

Table 12

CPA		Prodcom	
17.20.20	Woven fabrics	17.20.20.11	Cotton fabrics, <200 g of cotton per square meter, excluding gauze, for shirts, blouses
		17.20.20.12	Cotton fabrics, <200 g of cotton per square meter, excluding gauze, for other clothing

IV. Summary

There is a myriad of product classification systems in effect today, which include the domestic classifications HTS, Schedule B, SIC 7-digit, CIR, PPI product lines, I-O commodity classification and the international classifications ISIC, Rev.3, HS, SITC. In addition, there has been recent interest within NAFTA (i.e., Canada), the European Union, and in Australia and New Zealand in developing improved product classification systems. Each of these classifications has been developed or revised recently. Harmonization and comparability have been the primary objectives for these recent changes. The systems have been reviewed and revised at approximately the same time, with the opportunity being presented to incorporate the needs of the others into each. Compromises were made among both individual analytical interests (e.g., trade, production, national accounts) and systems used by individual nations.

It seems inefficient to require so many systems; however, each classification was developed to serve a particular purpose. ISIC was developed to classify producing units, the HS to provide for the collection of trade data (and to facilitate collection of tariffs), and the CPC to classify products. It is important to understand the purposes of each of the systems and to distinguish between those systems developed to classify the activity of producing units (industry classification system) and those developed to classify products or the output of those producing units (product classification system).

The ISIC is the international system in place to classify the activities of producing units. The HS is used for customs purposes and classifies products by physical characteristics. The SITC was developed for analyzing data on international trade and with but one exception utilizes the HS detail. The CPC is a complete product classification covering both goods and services which is linked to the HS. The CPA classifies products and services within the NACE, Rev. 1 industry classification. The Prodcom is a collection of production statistics for mining and quarrying, manufacturing, and electricity, gas, and water supply which is based upon the HS. The SCG is based upon the HS and is used in Canada to report domestic production and international trade data, too. The ANSCC is a CPC-based commodity classification that is in the process of being integrated with domestic product classifications.

Each of these international classifications was developed to serve quite different purposes. Although each classification is designed to measure an aspect of products, either goods produced or services provided, it does so from a unique perspective. Indeed, each of the country-level product classifications was constructed for specific uses.

A short summary of the salient characteristics of the various classification systems discussed follows.

International Classifications

- o Harmonized System -- The HS was developed to provide for detailed international trade statistics. It has been adopted by the major trading countries and provides the framework for the collection of import and export data. It is extremely detailed and classifies a product according to its physical characteristics. The system covers only transportable goods.
- o Central Product Classification -- The CPC was developed for countries to use either as is or as a framework for collecting production statistics. It is much less detailed than the HS, but does provide for comparability to the HS and, unlike the HS, it includes services.

- o Standard Industrial Trade Classification -- The SITC was developed to arrange the HS commodities into broader groupings for analytical purposes. It is not a data collection system, but rather a system that is to be used for analysis of data collected under the HS system. Countries report product information collected in their individual countries to the United Nations using SITC categories.
- o International Standard Industrial Classification -- The ISIC was developed by the United Nations to serve as a standard industrial classification for countries to adopt and to serve as a basis for comparisons among countries where each country has its own, unique industry classification system.

U.S. Classifications

- o Harmonized Tariff Schedule and Schedule B -- The HTS and Schedule B were developed in the U.S. from the HS to reflect its specific needs in collecting and reporting information on imports and exports, respectively. Both of these U.S. classifications cover only transportable goods and are more detailed than the HS.
- o Numerical List of Manufactured and Mineral Products -- The Census SIC 7-digit product codes were developed on an industry-of-origin basis with products assigned to a single 4-digit SIC industry, the industry to which the product is considered “primary.”
- o Producer Price Index Product Lines -- The BLS PPI product lines were developed so as to facilitate calculating industry specific price indices.
- o Input-Output Commodity Classification System -- The BEA I-O commodity classification was developed to facilitate construction of the national input-output tables.

Other Country Classifications

- o Standard Classification of Goods -- The Canadian SCG was developed to provide greater comparability between domestic production and internationally traded goods and services.
- o Standard Commodity Classification -- The Australian and New Zealand SCC was developed as the domestic equivalent to the UN CPC-based classification that would improve comparability between domestic production and internationally traded goods.
- o Classification of Products by Activity -- The CPA is an industry-of-origin classification developed by the European Union as the link of EU NACE to the UN CPC.
- o Commodity Production -- The Prodcom, a listing of transportable goods in mining, quarrying, manufacturing, electricity, gas, and water supply, was developed by the European Union as a link to the CPA.

Jack Triplett (1994), wrote:

A product grouping system is used for analyses from the demand side--to define

markets to study market power or to conduct marketing studies, for demand estimation, for determining the extent of substitution among commodities, and so forth. One does not want a product grouping system for studying productivity; an industry classification system produces the data for productivity analysis.

A product grouping system has the following characteristics:

- (a) It should incorporate, and facilitate the analysis of, relationships among products--demand relations, substitution relations, marketing relationships, uses by consumers or by other ultimate purchasers.
- (b) For demand and market analyses, the inputs to production generally do not matter for the intended data use. As a consequence, only the outputs matter in a product grouping system, no information on inputs need be collected.
- (c) Accordingly, product groupings may cut across the producing relationships in establishments, or other producing units. Establishment outputs may be separated and assigned to different product groupings, as the principles of the product grouping system dictate.

[T]here is no reason to integrate a product grouping system with an industry classification system, and there is every reason to avoid linking the two where they are in fact different. A product grouping system is intended to meet its own needs, and should meet those needs independently of the industry classification system, which is properly designed to serve a different purpose.⁴¹

This “fresh slate” examination of economic classifications for goods and services is the basis of the current ECPC Services Products Initiative, and the construction of such a conceptually-based product classification, one that is premised upon a demand-side, commodity-oriented concept, is the task of this Initiative. The final objective is to provide the NAPCS demand classification analog to the NAICS supply classification adopted in 1997. Whereas this initial work, due for completion in 2002, is focusing on services in four NAICS industries the goal for 2007 is to have a completely specified NAPCS. The full NAPCS will encompass all goods and services. The balance of the service industry product work and all of the goods industry product work will begin in 2002. In the continuing globalization of economies, since the Harmonized System provides the recognized international standard for describing and identifying tradeable goods, it is most logical that the HS should service as the basis for the definition of goods in the NAPCS.

Endnotes

1. *North American Industry Classification System: United States, 1997*, Executive Office of the President, Office of Management and Budget, Introduction, p. 11. See--<http://www.ntis.gov/naics>.
2. See <http://www.census.gov/epcd/naics/naicsfr9.html> and <http://www.census.gov/epcd/www/naics.html> for further information on NAICS.
3. Op. cit. *North American Industry Classification System*, Forward, p. 1.
4. "Plans, Organizational Structure, and Procedures for Phase 1: Exploratory Effort to Classify Service Products of Initiative to Create a Product Classification System," Economic Classification Policy Committee, December 2, 1998, pp. 1 and 3.
5. The current Initiative of the ECPC concentrates on classifying the services provided in four NAICS sectors: NAICS 51, Information; NAICS 52, Finance (excluding Insurance); NAICS 54, Professional, Scientific & Technical; and NAICS 56, Administrative & Support Services and Waste Management & Remediation Services. The ECPC intends that principles developed in classifying these services will be extended to the classification of all products, goods and services alike.
6. Economic Classification Policy Committee, "Issues Paper No. 1, Conceptual Issues," *Federal Register*, March 31, 1993, pp.16991-17000.
7. Jack E. Triplett, "The Theory of Industrial and Occupational Classifications and Related Phenomena," *1990 Annual Research Conference*, Bureau of the Census, March 18-21, 1990, pp. 9-25
8. Robert H. McGuckin, "Multiple Classification Systems for Economic Data: Can a Thousand Flowers Bloom? And Should They?" *1991 International Conference on the Classification of Economic Activity*, Bureau of the Census, Williamsburg, VA, November 6-8, 1991, pp. 1-4.
9. See--<http://www.census.gov/epcd/naics/issues1> for ECPC Issues Paper No. 1, "Conceptual Issues," pp. 12 and 14-15, which provides a fuller discussion of a demand-side aggregation system.
10. Op. cit. Triplett (1990).
11. Ibid., Triplett denotes this as Hicksian aggregation.
12. Ibid., pp. 22, 20-21.
13. Jack E. Triplett "Economic Concepts for Economic Classifications," *Survey of Current Business*, November, pp. 45-49. 1993, p. 46 says of a product grouping system, "*For uses that imply a demand-based concept*, grouping according to characteristics of the demand for commodities will provide the appropriate statistics. Examples of such data uses include calculating market share for studies of monopoly power, marketing analyses that are concerned with competitive shares, and demand studies concerned with either demand for consumption goods or demand for inputs to other production. For these uses, one groups commodities by similarities in the way commodities are used--close substitutes, for example, or alternatively, commodities that are used together." [Italics in the original.]
14. "Trade share" is defined as the ratio exports plus import to gross domestic product.

15. Specifically the Commission wrote,

Under the trade laws, the Commission has important responsibilities requiring significant reliance on statistics. A major responsibility concerns the assessment on a product specific basis of the impact of imports on the relevant domestic industry. The absolute quantity of imports, import trends, and import-to-consumption (market share) ratios ... to the relevant domestic industry. In addition, the Commission regularly prepares reports on a wide variety of economic issues. These reports, usually requested by the Executive branch or the Congress, may cover such matters as product specific competitive assessment studies, probable economic effect advice, price analysis, trade-related employment effects, and the effects of exchange rate fluctuations on trade. Further, on a daily basis the Commission furnishes to the Congress and the Executive branch information and analysis based on Federal economic statistics for use in making trade policy decisions.

The large majority of investigative reports and studies published by the Commission are based on the analysis of statistics and usually require data on a highly refined level of product detail.

There is very little comparability between trade classifications, on the one hand, and U.S. production classifications (the Standard Industrial Code [sic] or SIC), on the other hand. This makes it very difficult to calculate apparent consumption and import penetration, two factors which weigh heavily in many of the Commission's analyses.

[A] significant source of inaccuracy is the misreporting of SIC-based product code classification. Since the codes are industry oriented, and not product oriented.

The nature of the current SIC-based product codes and their purpose is such that substantial comparability with import and export data is not a likelihood. However, where feasible, Census has proposed changes to align the codes with individual Harmonized System categories.

[And,] there are few detailed data on the services industries.

“Memorandum to the President's Economic Policy Council, on the Request by the Council's Working Group for Comments on the Quality of Federal Economic Statistics,” U. S. International Trade Commission, Washington, DC, August 1, 1986, 11 pages--see pp. 1-2, 6, 8, 10.

16. NAFTA--North American Free Trade Agreement; APEC--Asia-Pacific Economic Cooperation; OECD--Organization of Economic Cooperation and Development; UN--United Nations; WCO--World Customs Organization; WTO--World Trade Organization.
17. The Voorburg Group was established in 1986, after an initiative by Statistics Canada and the United Nations Statistical Office (UNSO). This initiative came in response to the observation that service statistics were less developed than statistics on the other economic fields although services contributed already over half of the Gross Domestic Product in many countries. The Group's main purpose remains to be an informal forum for the exchange of views on services statistics, as a result of which countries, international organizations and EUROSTAT may be assisted in, or directed towards the solution of particular problems or the development of international guidelines or handbooks in the field of service statistics.

18. Report of the CPC Sub-Group of the Voorburg Group: Voorburg Group on Services Statistics - Rome, September 21-24, 1998 by Shaila Nijhowne, Chairman, CPC-Subgroup of the Voorburg Group. Fourth Meeting of the Expert Group on International Economic and Social Classifications, New York, 2-4 November 1998. ESA/STAT/AC.63/16, 23 October 1998. See--
www.un.org/Depts/unsd/class/listdoc1.htm.
19. See--<http://www.wcoomd.org/idxfren.htm>.
20. See--<http://www.un.org/Depts/unsd/class/cpcmain.htm>.
21. *Central Product Classification (CPC), Version 1.0*, Statistical Papers, Series M No. 77, Ver.1.0, New York: United Nations, 1998, pp. 6-9, 13, and 14.
22. See--<http://www.un.org/Depts/unsd/class/sitcprof.htm>.
23. See--<http://www.un.org/Depts/unsd/class/isicmain.htm>.
24. The General Industrial Classification System of Economic Activities within the European Union, the Nomenclature des Activités économiques des Communautés Européennes (NACE), was developed by the European Union statistical agency, EUROSTAT, to serve as the standard industry classification system for the Community. EUROSTAT states that NACE accepts the full detail of ISIC, Rev. 3, and provides for further subdivisions that can be aggregated directly into ISIC industries. NACE is more detailed than ISIC, but has followed the same approach as ISIC, with an emphasis on products as the basis for defining industries
25. The United States Trade Representative (USTR) is responsible for coordination of United States trade policy in relation to the International Convention on the Harmonized Commodity Description and Coding System (Convention). Subject to the policy direction of the Office of USTR, the Departments of Treasury and Commerce and the United States International Trade Commission (USITC) are the U.S. Agencies delegated primary responsibility for formulating United States Government positions on technical and procedural issues and for representing the Government in the development of the Convention. The U.S. Customs Service (Treasury), the Bureau of the Census (Commerce) and the USITC (Chair), functioning as the 484e Committee, make recommendations to the President for approval and proclamation to maintain the comparability of the U.S. HTS and Schedule B nomenclatures with the HS. Furthermore, under authority of section 484(e) of the Tariff Act of 1930 (19 U.S.C. 1484(e)), the Committee is given responsibility for assuring the soundness, relevance, and currency of the U.S. trade nomenclatures. For details on the HTS and Schedule B nomenclatures, see--<http://www.usitc.gov/taffairs.htm> and -
<http://www.customs.ustreas.gov/imp-exp/rulings/harmoniz/index.htm>.
26. The 9th and 10th U.S. HTS digits, those which are designated for statistical purposes, are proposed by petition of business and government users of the U.S. import data.
27. *1992 Census of Manufactures and Census of Mineral Industries, Reference Series, Numerical List of Manufactured and Mineral Products, MC92-R-1*, Appendix G. Selected Product Classes and Products Primary to More Than One Industry, pp. G-1-G-3.

28. Ibid., Introduction, p. V, See--
http://blue.census.gov/search97cgi/s97_wraptite?action=View&VdkVgwKey=%2Fftp%2Fpub%2Fprod%2Fwww%2Ftitles%2Ehtml&DocOffset=1&DocsFound=1&QueryZip=Numerical+List&Collection=a2z%5Fhtml&Collection=a2z%5Fpdf&SearchUrl=http%3A%2F%2Fblue%2Ecensus%2Egov%2Fsearch97cgi%2Fs97%5Fwraptite%3Faction%3DFilterSearch%26QueryZip%3DNumerical%2BList%26ResultTemplate%3Da2z%252Ehtml%26QueryText%3DNumerical%2BList%26Collection%3Da2z%255Fhtml%26Collection%3Da2z%255Fpdf%26ResultStart%3D1%26ResultCount%3D20&#mm.
29. “Developing a Product Classification System for the United States,” Carole A. Ambler, U.S. Bureau of the Census, draft, June, 1998.
30. Op. cit. *1992 Census of Manufactures and Census of Mineral Industries, Reference Series Numerical List of Manufactured and Mineral Products*, MC92-R-1, pp. V and VI.
31. PPI Program Spotlight, Bureau of Labor Statistics, U.S. Department of Labor, No. 98-2, p. 1.
32. “PPI Experience in Formulating Product Lines in the Service Sector,” Irwin B. Gerduk, Bureau of Labor Statistics, May, 1998. pp. 2 & 3.
33. Op. cit. PPI Program Spotlight.
34. *Benchmark Input-Output Accounts of the United States, 1992*, Bureau of Economic Analysis, Economics and Statistics Administration, U.S. Department of Commerce, September 1998, pp. M-14-M-15.
35. Ibid.
36. The Standard Classification of Goods is published by Standards Division of Statistics Canada, Shaila Nijhowne, Director. For further information regarding the SCG, contact the: Commodity Section, Standards Division, Statistics Canada, Ottawa K1A 0T6, Telephone: (613) 951-3464, Fax: (613) 951-8578.
37. “Introduction to the 1996 Standard Classification of Goods,” Standards Division, Statistics Canada, pp. 3, 5-7.
38. Implementation of the CPC in Australia, Australian Bureau of Statistics, Third Meeting of the Expert Group on International Economic and Social Classifications, United Nations Department of Economic and Social Affairs Statistics Division, New York, 1-3 December 1997, ESA/STAT/AC.60/11. See--
<http://www.un.org/Depts/unsd/class/listdoc.htm>.
39. Ibid.
40. See--<http://europa.eu.int/en/comm/eurostat/serven/home.htm>.
41. Jack E. Triplett, “Economic Classifications in the New North American Industry Classification System (NAICS),” paper prepared for the Seminar on New Directions in Statistical Methodology, Washington, DC, May 25, 1994, pp. 6-7.