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Classification by Broad Economic Categories Rev.5

Defined in terms of the Harmonized Commodity Description and
Coding System (2012) and the Central Product Classification, 2.1



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PREFACE

The Classification by Broad Economic Categories (BEC) is an international product classification. Its main purpose is to provide a set of broad product categories for the analysis of trade statistics.

Since its adoption in 1971, statistical offices around the world have used the BEC to report trade statistics in a concise and meaningful way, and researchers have used BEC data for analyses.

This fifth revision of the BEC (BEC Rev.5) is the outcome of a review process that spanned several years and involved contributions from many classifications experts and data users around the world. This process resulted in a structure that is both more detailed and more logical than the previous version. It responds to the need for more relevant economic categories, includes services in addition to goods, and more clearly distinguishes the end-use of products. New broad categories include “Mining and energy”, “Construction and housing”, “Textile and footwear”, “Information and communication” and “Health and education”. The importance of the BEC for the analysis of global value chains is also highlighted in this manual. In that regard, BEC Rev.5 distinguishes generic and specified intermediate products as a new dimension within the processed intermediate end use category.

BEC Rev.5 was considered and endorsed for international use by the Statistical Commission at its forty-seventh session, in March 2016.

ACKNOWLEDGEMENTS

In carrying out the revision of the BEC, the active participation of the Statistical Commission, the Expert Group on International Economic and Social Classifications and its Technical Subgroup were all vital.

Further inputs in this process were received from members of the UN Task Forces on International Merchandise Trade Statistics and on Statistics of International Trade in Services, as well as of the OECD Working Party on International Trade in Goods and Services Statistics.

The BEC Rev.5 process benefited from the coordination and support of the Chairman of the Expert Group on International Economic and Social Classifications, Andrew Hancock of Statistics New Zealand, as well as the Chair of the Technical Subgroup of the BEC Revision, Norbert Rainer of Statistics Austria. Helpful comments were also provided by the following members of the Subgroup: Ashish Kumar and Dr. Sinha (India), Ana Franco, Axel Behrens, Michael Mietzner and Veijo-Ismo Ritola (Eurostat), Nadim Ahmad, Fabienne Fortanier, Bettina Wistrom, Norihiko Yamano, Sebastien Miroudot and Colin Webb (OECD), Olga Memedovic and Shyam Upadhyaya (UNIDO), Tom Beris (WCO), Joscelyn Magdeleine and Andreas Maurer (WTO), Federico Dorin (UNECLAC), Karoly Kovacs, Markie Muryawan, Luis Gonzalez, Matthias Reister and Ronald Jansen (UNSD) and Tim Sturgeon as consultant for UNSD.

Special thanks to Tim Sturgeon, who was active throughout the revision process and especially during the final phases of editing. His work was executed in close cooperation with Ronald Jansen of UNSD, who was directly responsible for the different stages of the revision process, including the organization of meetings and consultation rounds.

SUPPORT FOR BEC USERS

The United Nations Statistics Division (UNSD) is responsible for the development and maintenance of BEC Rev.5 and its correspondence tables. Users of BEC are encouraged to request clarification, share their experience and remarks with regard to the adequacy of the classification, and provide ideas or proposals for enhancing its usefulness.

UNSD will use its website to provide further information on the rationale and possible applications of the BEC and make the correspondence tables of BEC with HS, CPC, EBOPS and ISIC available. Those tables will be subject to modification since the BEC classification is based on actual trade practice and such practice may change over time. Again, users are encouraged to report changes in trade practice regarding particular detailed HS commodities.

Updated information on BEC and its correspondence tables are available from the web site of the United Nations Statistics Division at <http://unstats.un.org/unsd/trade>

International trade statistics in terms of BEC are available from the UN Comtrade website at <http://comtrade.un.org>

Questions regarding BEC can be sent to comtrade@un.org

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Table of Contents

PREFACE.....	II
ACKNOWLEDGEMENTS.....	III
SUPPORT FOR BEC USERS.....	IV
I. INTRODUCTION.....	6
A. HISTORICAL BACKGROUND	6
B. RECENT DEVELOPMENTS.....	8
II. MOTIVATION TO REVISE THE BEC	9
A. DECISION TAKEN BY THE UNITED NATIONS STATISTICAL COMMISSION.....	9
B. WHO IS USING THE BEC AND FOR WHAT PURPOSES?	9
C. IMPROVING THE STRUCTURE OF THE BEC.....	10
D. INCLUSION OF SERVICES IN BEC REV.5.....	12
E. BEC AND GLOBAL VALUE CHAIN ANALYSIS.....	13
III. THE STRUCTURE OF BEC REV.5.....	14
A. DIMENSION OF BROAD ECONOMIC CATEGORIES – TOP LEVEL	14
B. PRODUCT DIMENSION – SECOND LEVEL.....	14
C. THE SNA END-USE DIMENSION – THIRD LEVEL.....	15
D. PROCESSING DIMENSION – FOURTH LEVEL.....	16
E. SPECIFICATION DIMENSION – FIFTH LEVEL	17
F. DURABILITY DIMENSION – SIXTH LEVEL	18
G. SPECIFIC COMBINATIONS OF THE 6 DIMENSIONS.....	19
IV. THE COMPILATION OF THE BEC.....	19
A. CODING OF BEC REV.5.....	19
B. DISTRIBUTION OF THE CPC SERVICES AND HS GOODS CATEGORIES ACROSS BEC MAIN CATEGORIES	20
C. IDENTIFICATION OF THE END-USE CATEGORIES.....	20
V. RELATIONSHIP TO OTHER CLASSIFICATIONS	21
A. RELATIONSHIP TO THE CENTRAL PRODUCT CLASSIFICATION.....	21
B. RELATIONSHIP TO THE HARMONIZED SYSTEM	22
C. RELATIONSHIP TO THE STANDARD INTERNATIONAL TRADE CLASSIFICATION.....	22
D. RELATIONSHIP TO OTHER STANDARD CLASSIFICATIONS	22
E. RELATIONSHIP TO EARLIER REVISIONS.....	23
ANNEX 1: STRUCTURE OF THE BEC REV.5	24

I. INTRODUCTION

1. This manual describes and explains in detail the fifth revision of the Classification by Broad Economic Categories (BEC Rev.5). The BEC is, essentially, a high-level aggregation of existing product classifications. It provides an overview of international trade based on the detailed commodity classifications in the Standard International Trade Classification (SITC), the Harmonized Commodity and Coding System (HS) and the Central Product Classification (CPC). Its comparative advantage has traditionally been the classification of *goods* by *end-use* category. This facilitates a range of analytical applications, such as the relative integration of economies in global value chains, and statistical applications, such as commodity flow approaches to estimating GDP.

A. *Historical background*

2. At its thirteenth session, in 1965, the Statistical Commission recommended that data on broad economic categories of commodities be compiled to supplement summary data of imports and exports based the sections of the Standard International Trade Classification (SITC). Categories included food, industrial supplies, capital equipment, and consumer durables and non-durables.

3. In accordance with the Commission's request, a revised draft of the BEC was prepared at the fifteenth session. It was comprised of seven broad categories, including the original five categories plus "fuels and lubricants" and "transport equipment" (see Table 1). Within the categories of "capital goods" and "transport equipment" a further distinction was made between finished equipment and "parts and accessories". Within the categories of "food and beverages", "industrial supplies (non-food)" and "fuels and lubricants" a distinction was made between primary commodities and processed commodities. Within the categories of "primary food and beverages", "processed food and beverages" and "transport equipment (other than passenger motor vehicles)" a distinction was made between commodities for industry use and those for household consumption. The Commission was of the opinion that the distinction between industrial and household end use could not be made for "motor spirits" (gasoline) or "passenger motor vehicles". Finally, the Commission requested a better definition in the distinction between durable and non-durable consumption goods, resulting in a "semi-durable" sub-category within the "consumer goods not elsewhere specified" category.

4. A final list of product categories was submitted in the report¹ of the Secretary General at the sixteenth session of the Commission in 1970. The resulting nineteen categories were a response to the comments made by the Commission itself, by individual countries and by international organizations, and were designed to enable users to obtain aggregates as comparable as possible to the three basic end-use classes in the System of National Accounts (SNA): capital goods, intermediate goods, and consumption goods. It was left to users to make

¹ E/CN.3/408 (1970)

their own apportionment among SNA end-use classes for “motor spirits” (gasoline), and “passenger motor vehicles.”

5. After being defined in terms of the basic headings of the SITC, the original BEC was issued in 1971. Although its overall structure and coverage has remained unchanged since, it has been revised four times:

1. The first revision, in 1976, conformed the BEC to the changes in SITC Revision 2.
2. The second revision, in 1984, conformed the BEC to SITC Revision 3.
3. The third revision, in 1986, corrected some oversights in the 1984 revision.
4. The fourth revision, in 2002, took into account the more detailed description of commodities provided by the 2002 edition of the HS classification, and guidelines for determining the main end-use (see third column of Table 1).

6. International commodity trade statistics are available on the UN Comtrade website according to the BEC, as well as by various revisions of SITC (1-4) and HS (1992, 1996, 2002, 2007 and 2012). Although coverage varies by reporting economy, BEC statistics are generally available in UN Comtrade for annual data referring to the years 1995 onwards. Data are available for each of the three levels and all of the sub-categories in Table 1.

Table 1. BEC Rev.4, its unique categories, and its SNA classes

Classification of goods by Broad Economic Categories	Unique categories	Basic classes in SNA
1 Food and beverages		
11 Primary		
111 Mainly for industry	1	Intermediate
112 Mainly for household consumption	2	Consumption
12 – Processed		
121 Mainly for industry	3	Intermediate
122 Mainly for household consumption	4	Consumption
2 Industrial supplies not elsewhere specified		
21 Primary	5	Intermediate
22 Processed	6	Intermediate
3 Fuels and lubricants		
31 Primary	7	Intermediate
32 Processed		
321 Motor spirit	8	<i>Not classified</i>
322 Other	9	Intermediate
4 Capital goods (except transport equipment), and parts and accessories thereof		
41 Capital goods (except transport equipment)	10	Capital
42 Parts and accessories	11	Intermediate
5 - Transport equipment and parts and accessories thereof		
51 Passenger motor vehicles	12	<i>Not classified</i>
52 Other		
521 Industrial	13	Capital

522 Non-industrial	14	Consumption
53 Parts and accessories	15	Intermediate
6 Consumer goods not elsewhere specified		
61 Durable	16	Consumption
62 Semi-durable	17	Consumption
63 Non-durable	18	Consumption
7 - Goods not elsewhere specified	19	<i>Not classified</i>

B. Recent developments

7. The BEC was first proposed in 1965 and adopted by the UN Statistical Commission in 1971. Since then its structure and coverage have remained unchanged, despite four revisions to conform to new and updated product classifications², and despite the significant changes in international trade, as well as changes in economic accounting standards³.

8. In addition to vast increases in the scale of international trade in recent decades, there have been two important changes in its character. Firstly, services trade has become much more important, including services embedded in products with high intellectual property content. Secondly, businesses, especially large corporations, have organized their operations across a number of countries within complex global value chains. Instead of intermediate and final production taking place all within one exporting country, exports are more likely to embody intermediate goods and services sourced from any number of countries. Thus, the value and characteristics of exports do not fully reflect the production and technological capabilities of the exporter. Because of global value chains, and well as increased flows of primary commodities, total trade in intermediate products has risen faster than global GDP over the last two decades. When value is added in multiple countries prior to final consumption, the value embodied in intermediate goods and services can be counted more than once in export statistics⁴.

9. In response to these changes, the fifth revision of the BEC is more thorough than prior revisions.

- It adds *services* and therefore refers to *products* rather than *goods*.
- It provides a new top level of broad economic categories, based on the main outputs of corresponding industries, to facilitate broad analyses of trade and production.
- It identifies SNA end-use as a separate dimension.

² Namely, the Standard International Trade Classification (SITC) and the Harmonized Commodity Description and Coding System (HS)

³ The 2008 System of National Accounts and sixth edition of the Balance of Payments manual, for example, recommended strict implementations of the changes of ownership rule, the introduction of a new category of manufacturing services in services trade statistics, and the shift of merchanting from services to goods.

⁴ When the financial crisis in 2008-2009 caused a much larger collapse in terms of trade than in terms of GDP, the discrepancy was partly attributed to such ‘double counting’ of trade in intermediate products.

- It adds a new variable (the *specification dimension*) to differentiate intermediates that are *generic*, i.e. consumed across a wide range of industries, from those that are *specified*, i.e. typically consumed only in certain industries.

10. The manual consists of five sections and two annexes. Section II discusses the motivation for the current revision. Section III describes in detail the new dimensions of BEC Rev.5, whereas section IV briefly provides information on its compilation and section V on its relationship to other classifications. The annexes give the full structure and coding of BEC Rev.5 and its correspondence to the goods categories of the HS and the services categories of the CPC.

II. MOTIVATION TO REVISE THE BEC

A. *Decision taken by the United Nations Statistical Commission*

11. At its 43rd session in 2012, the United Nations Statistical Commission agreed with the proposals made by the Expert Group on International Statistical Classifications to revise the BEC and establish a technical subgroup⁵ tasked with the preparation of this fifth revision. The terms of reference of the technical subgroup identified four areas for improvement:

- (i) Re-defining BEC structure to better reflect current economic reality,
- (ii) extending the BEC's scope to include services as well as goods, while giving extra attention to the definition of intermediate goods,
- (iii) improving explanatory materials to help both compilers and users of data disseminated according to BEC, and
- (iv) providing updated correspondence tables to link BEC with other statistical classifications.

12. At its 47th session in 2016, the Statistical Commission endorsed the fifth revision of the Classification by Broad Economic Categories for use as an international statistical classification under Decision 47/108⁶.

B. *Who is using the BEC and for what purposes?*

13. Effective revision of the BEC requires an understanding of its uses and limitations. In a literature review⁷ covering the period 1971 to 2015, more than 500 articles and reports made reference to the BEC, with more than 80% occurring after 2000. While these citations appear in a wide range of policy publications and academic journals⁸, the main focus has been on describing,

⁵ The members of the Technical Sub-group are given in the acknowledgement section

⁶ See <http://unstats.un.org/unsd/statcom/47th-session/documents/Report-on-the-47th-session-of-the-statistical-commission-E.pdf>

⁷ An overview of these references is provided on the UNSD website at <http://unstats.un.org/unsd/trade/BEC/>

⁸ See for example the Journal of International Economics, China Economic Review, Journal of Economic Integration, Review of World Economics, Journal of Development Economics, Emerging Markets Finance and Trade, Business and Economic History, Review of Income and Wealth, Review of World Economics, International Journal of Development Planning Literature, The World Economy, Journal of African Economies, Economie Internationale, China & World Economy, and The International Trade Journal.

assessing and explaining observed patterns in international trade, tariff effects, trade policy, and development economics. One of the most important areas of research has been intra-industry trade, which, by identifying a propensity for countries to trade similar products, challenged some long-standing assumptions about comparative advantage and specialization in international trade. While some of this research has depended on finer distinctions between otherwise homogeneous products (trade in different brands of passenger vehicles, for example), coupled with other data sources, the BEC has provided comparative insights into variations in horizontal and vertical intra-industry trade (i.e. across industries and across the BEC classes).

14. In addition to its usefulness as a tool for the analysis of trade and trade policy, BEC has also been widely used for analysis within the statistical system. Specifically, the end-use categorization of imported goods provided by BEC has been useful in commodity flow analysis used for the construction of national accounts estimates of GDP and in particular for the construction of national Supply and Use Tables. This approach works on the assumption that there is a unique relationship between each product and its end-use classification that allows it be allocated within a Supply-Use framework as either intermediate consumption, gross fixed capital formation, or other final consumption.

15. Of course it has been recognized that this assumption does not always hold, requiring national accountants to check and adjust BEC end use classifications using supplemental data sources. For example, even if a certain product is by its nature a consumer product, this does not mean that 100% of total supply of that product is purchased by private households. Bananas are certainly purchased by consumers, but a certain share of the total import of bananas may also be used as intermediate consumption in the food and restaurant industry. This duality of use naturally affects a number of product groups (in theory all) to varying degrees. Personal computers, for example, are sold to households and business as fixed capital investments, but could also be recorded as intermediate consumption when incorporated into larger industrial and corporate IT systems that are thereafter sold to end users as final products. Indeed, it is because of these dual-use ambiguities (in particular those where the use is not disproportionately in one particular category), that earlier versions of the BEC did not allocate end-use categories to passenger vehicles and motor spirits.

C. Improving the Structure of the BEC

16. The motivation to revise, and in the process improve the BEC reflects a number of factors. Perhaps the most important is the need to introduce greater clarity and simplicity in the structure of the BEC. This streamlining and simplification can be seen by comparing Figure 1, which shows the confusing and complex relationships between categories in BEC Rev.4, to Figure 2, which shows the clear, logical hierarchy in BEC Rev.5. Crucially, there is a full separation made between economic and end-use categories. The revision also takes the opportunity to introducing a new variable (*specification dimension*) to help in the analysis of global value chains.

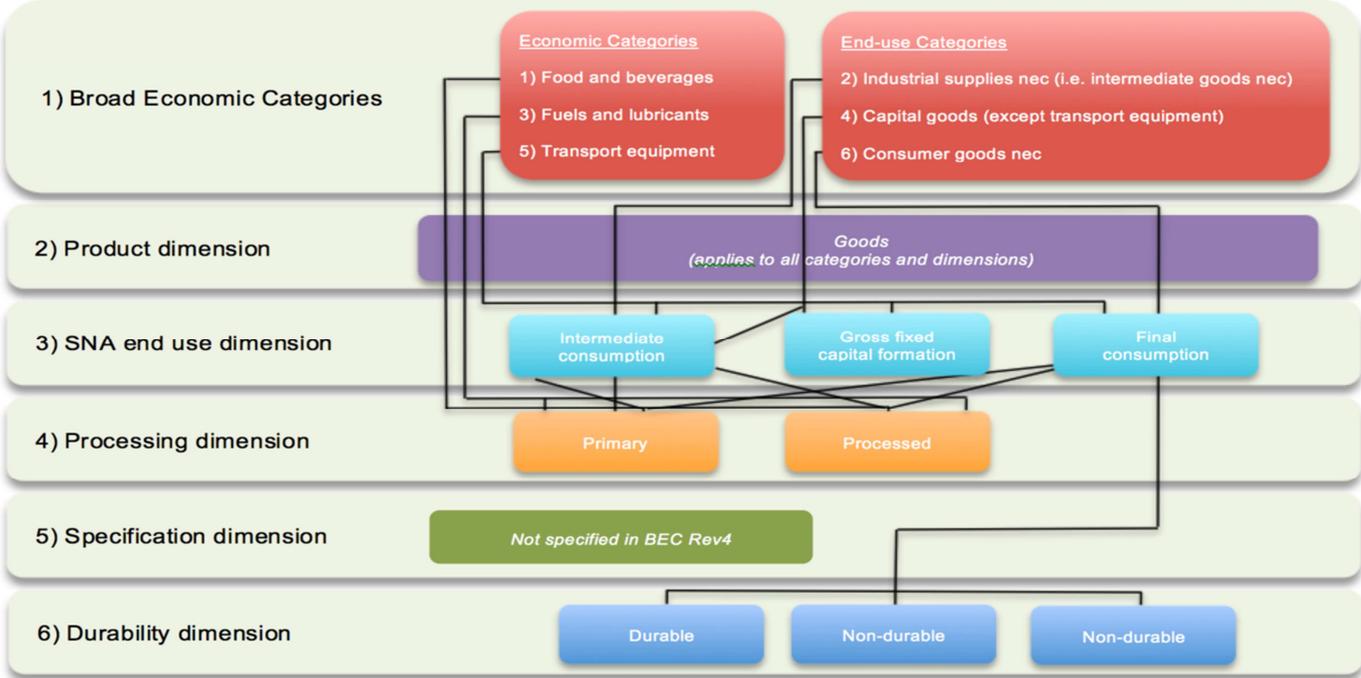
17. Because the new structure of BEC Rev.5 creates a clear separation of economic categories, based on underlying products and end-use categories, it is easier to interpret. BEC 4 relies on a confusing hybrid approach that defines some broad economic categories on the basis

of the product characteristics (food and beverages, fuels and lubricants, and transport equipment), with further links to their end-use categories, while others are defined on the basis of their end-use and included as top-level broad categories (industrial supplies, capital goods, and consumer goods). In other words, end-use appears in BEC Rev.4 as both top-level categories and as sub-categories of other top-level economic categories.

18. The new structure of the BEC will make it possible to identify end-use within each of the broad categories. For instance, users will be able to identify capital formation within economic categories such as construction and ICT (capital formation was a single category in BEC Rev.4). This is important because of significant differences in prices and depreciation in capital equipment across economic categories. For example, ICT generally experiences declining prices and high depreciation rates while construction typically experiences low depreciation rates and rising prices in capital equipment.

19. By defining broad economic categories entirely on the basis of the underlying products (instead of mixing it with end-use categories as was the case in previous revisions of the BEC), BEC Rev.5 will provide greater international comparability, because the products included in a given economic category will be in concordance with classifications agreed to by members of the global statistical community: the Harmonized Commodity and Coding System (HS) for goods the basic services categories of the Central Product Classification (CPC) for services.

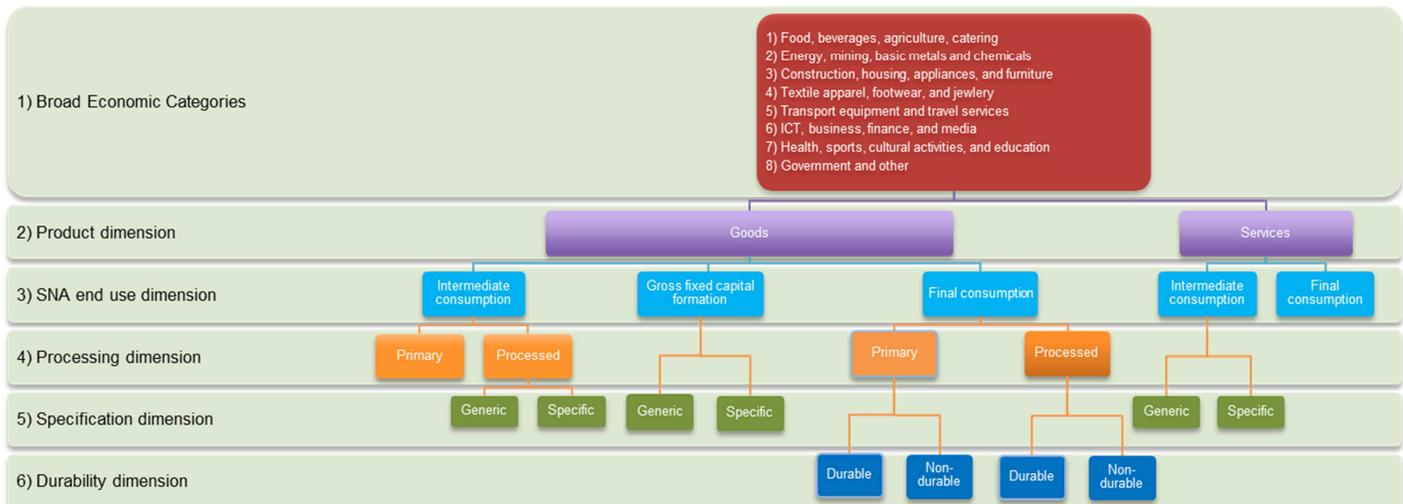
Figure 1. BEC Rev.4 - Relationships



20. As already mentioned, the allocation of products to end-use categories comes with some non-trivial challenges. For many products it is fairly clear which end-use category is relevant. In such cases a simple correspondence table between HS (and CPC) and BEC will suffice to define

end-use. However, products for which the end-use is not so clear-cut will require national accounts to determine end-use proportionality using established practices.

Figure 2. BEC Rev.5 - Relationships



D. Inclusion of Services in BEC Rev.5

21. The growing importance of services has led to recognition of the need to include them in the product dimension in BEC. Almost all of the defining features of services, namely that they are non-tradable, non-storable, customized, and insensitive to price competition, are changing in ways that enable and motivate international trade. Task fragmentation, codification, monitoring, and trade in services are burgeoning, both domestically and internationally. Services have become the focus of intense international competition and dynamic innovation, and are thus of growing interest to policy-makers.

22. With standardization, commodification, and increasing scale, labor inputs to services have become more sensitive to costs, providing enterprises with the motivation to take advantage of the new domestic and international sourcing options for a wide range of services and business functions, including software coding, “back office” administrative tasks, sales, customer service, and even elements of research and development. Economies such as India and the Philippines rely on services exports for economic growth and services comprise a larger share of the production and consumption of goods. For these reasons, there is consensus that the time has come to include services in the BEC classification.

E. BEC and Global Value Chain analysis

23. The rise of global value chains has made the analytical distinction between trade in intermediates and trade in final goods more important⁹. Trade in terms of end use categories highlights the bilateral relationships in the trade of intermediate and final products that are crucial to understanding the dynamics of contemporary trends in international trade and economic globalization. A more complete picture of such economic interconnectedness has been the development of global input-output tables and indicators of Trade in Value-Added (TiVA), such as the import content of exports.¹⁰

24. However, researchers have found the definition of intermediates in BEC Rev.4 too broad for examining global value chain participation¹¹, even with the sub-classes of primary and processed intermediates available in three broad categories (food and beverages, industrial supplies, and fuels and lubricants). The usefulness of the “processed” intermediate goods category in BEC Rev.4 as a proxy for global value chain related trade has been explicitly investigated¹². It was found that the processed intermediate goods category contained many generic products with published reference prices (e.g., cotton bales, linseed oil) or commonly sold at auction, as well as more differentiated, complex intermediate products intended for use in specific industries and for specific final goods (e.g. auto parts made for a specific brand or model of car). The “specific” processed intermediate goods category was therefore created for BEC Rev.5 to better identify global value chain related trade (see section III-E for more detail).

25. Figure 3 shows how a general categorization of value added can be extracted from the structure of BEC Rev. 5. This model begins with primary intermediates in the processing dimension, followed by the increasing end-product specificity in the specification dimension (generic and then specific processed intermediates), and end with final consumption goods and services, as depicted in Figure 3.

Figure 3. BEC Rev.5, Value Added Chain



⁹ In using the term global value chains we mean to refer to the broad swath of literature analyzing roughly similar phenomena variously referred to as production sharing, vertical specialization, the fragmentation or disintegration of production, offshore outsourcing, and trade in value added.

¹⁰ Miroudot et al (2009), OECD (2012), WTO (2011), and Escaith (2014) are examples of GVC-related research in which the identification of intermediate goods plays a critical role.

¹¹ See for example Hummels, Ishi and Yi (2001). “The Nature and Growth of Vertical Specialization in World Trade” or Yeats (1998). “Just How Big is Global Production Sharing”

¹² See Sturgeon, Timothy and Olga Memedovic (2010). “Mapping Global Value Chains: Intermediate Goods Trade and Structural Change in the World Economy”. UNIDO Working Paper 05/2010

III. THE STRUCTURE OF BEC REV.5

A. *Dimension of Broad Economic Categories – Top Level*

26. As requested by the Statistical Commission, the broad economic categories should be relevant for current economic reality. A basis for the construction of those main economic classes can be the International Standard Industrial Classification of all Economic Activities (ISIC), since ISIC reflects the economic structure of societies and since the definition of economic activity in ISIC is based on the type of production carried out by economic units, where these units can be grouped to form industries. Those industries typically produce certain kinds of goods and services. In this way, the descriptions of the (top level) economic categories of BEC Rev.5 are derived from the ISIC categories and their corresponding basic product headings in HS (for goods) and CPC (for services). Whereas CPC also includes goods, the correspondence of BEC with HS is preferred for the goods classification given the extra detail in HS.

27. The UNSD website¹³ created for the BEC shows in full detail the product codes of HS and CPC included in the top-level BEC categories and their relationship to ISIC, Rev.4 codes. This relationship with ISIC should be understood as a correspondence between economic sectors (ISIC) and the goods and services (BEC) they typically produce. The full correspondence of HS and CPC with all the six dimensions of the BEC is available and will be maintained on the website of the UN Statistics Division. This maintenance refers to additional advice received from industry experts on the end-use of certain HS commodity categories and refers to adapting to the changes in the HS classification, as it will soon move to its 2017 edition.

B. *Product dimension – Second Level*

Two categories: (1) Goods and (2) Services; this distinction only applies to the end-use of intermediate and final consumption; services do not apply to gross fixed capital formation.

28. The 2008 SNA refers to products¹⁴ as goods, services and knowledge capturing products. The second level of BEC only refers to goods and services, where services include the knowledge capturing products. In other words, BEC Rev.5 follows the SNA definition of goods, and defines services as the combination of the SNA definition of services together with the SNA definition of knowledge capturing products. The SNA definitions are as follows.

29. The SNA defines *goods* as physical objects for which a demand exists, over which ownership rights can be established and whose ownership can be transferred from one institutional unit to another by engaging in transactions on markets. They are in demand because they may be used to satisfy the needs or wants of households or the community or used to produce other goods or services. The production and exchange of goods are quite separate

¹³ See <http://unstats.un.org/unsd/trade/BEC/>

¹⁴ See 2008 SNA, Chapter 6, para 15-22

activities. Some goods may never be exchanged while others may be bought and sold numerous times. The production of a good can always be separated from its subsequent sale or resale.

30. The SNA defines *services* as the result of a production activity that changes the conditions of the consuming units, or facilitates the exchange of products or financial assets. These types of services may be described as change effecting services and margin services respectively. Change-effecting services are outputs produced to order and typically consist of changes in the conditions of the consuming units realized by the activities of producers at the demand of the consumers. Change-effecting services are not separate entities over which ownership rights can be established. They cannot be traded separately from their production. By the time their production is completed, they must have been provided to the consumers.

31. As mentioned, BEC Rev.5 includes *knowledge-capturing products* in its services category. *Knowledge-capturing products* are defined in the 2008 SNA as those products that involve provision, storage, communication and dissemination of information, advice and entertainment in such a way that the consuming unit can access the knowledge repeatedly. Knowledge-capturing products include news, consultancy reports, computer programs, movies, music, etc. The outputs of these industries are often stored on physical objects (whether on paper or on electronic media) that can be traded like ordinary goods. Ownership rights can be established and they can be used repeatedly. Thus, knowledge-capturing products can sometimes have many of the characteristics of goods. Whether they are embodied in goods or services, knowledge-capturing products can be produced by one unit and supplied to another, creating a division of labour and the driving the emergence of markets. When this division of labor is international in scope, they become part of a GVC.

C. The SNA end-use dimension – Third Level

Three categories: (1) intermediate consumption; (2) gross fixed capital formation; and (3) final consumption

32. The third level of the BEC is the distinction between end-use categories. As previously mentioned, the proposed structure differs from earlier revisions of the BEC in that it independently classifies end-use categories; no end-use category constitutes a broad economic category, and each economic category is completely decomposable by end-use.

33. Consumption is an activity in which institutional units use up goods or services, but there are two quite different kinds of consumption. Intermediate consumption consists of goods and services used up in the course of production within the accounting period. Final consumption consists of goods and services used by individual households or the community to satisfy their individual or collective needs or wants. The activity of gross fixed capital formation, like intermediate consumption, is restricted to institutional units in their capacity as producers. Fixed assets are produced assets (such as machinery, equipment, buildings or other structures) that are used repeatedly or continuously in production over several accounting periods (more than one year). The distinction between intermediate consumption and gross capital formation depends on whether the goods and services involved are completely used up in the accounting period or not.

If they are, the use of them is a current transaction recorded as intermediate consumption; if not it is an accumulation transaction recorded in the capital account.

34. The general nature and purpose of the distinction between gross fixed capital formation and consumption, whether intermediate or final, is clear. The distinction is fundamental for economic analysis and policymaking. Nevertheless, the borderline between consumption and gross fixed capital formation is not always easy to determine in practice. Certain activities contain some elements that appear to be consumption and at the same time others that appear to be capital formation.

D. Processing dimension – Fourth level

Two categories: (1) Primary and (2) Processed; this distinction only applies to goods and only to intermediate and final consumption (no primary goods as gross fixed capital formation)

35. At the fourth level of the BEC a distinction is made between primary goods and processed goods. This distinction only applies to goods. The definition of primary versus processed goods is taken from the original formulation¹⁵ of the BEC. Primary goods are those which characteristically are products of primary sectors of the economy – i.e., farming, forestry, fishing, and the extractive industries. However, goods which characteristically are products of other sectors, such as manufacturing, where the product underwent only a minor change, are still classified as “primary” in cases where nearly all of the value of the product is contributed by one of the primary sectors of the economy. For example, cotton undergoes physical transformation when ginned, but as most of the value of the ginned cotton derives from the agricultural sector, it is classified, in the BEC, as a primary good. Thus, a good is classified as primary if it is a product of farm, forest and fishing, or of an extractive industry, to whose value transformation has made only a minor contribution. Guidance in classifying goods as primary or processed can further be sought in the description of and explanation associated with the HS sub-headings, which uses wording such as “raw”, “in the rough”, “in primary form” or “combed but not otherwise processed”. Waste and scrap materials are also classified as primary commodities in the BEC.

36. Canned and prepared food, on the other hand, owe much of their value to the food-processing industry and are generally classified as processed goods. In general, if a good is not defined as a primary good, then it is classified as a processed good. The processing dimension of BEC Rev.5 provides insights into the position of enterprises within global value chain. Generally, producers of primary goods are higher upstream (at the beginning of the production chain) in the value added chain than enterprises that consume primary goods for further processing (see Figure 3).

¹⁵ See E/CN.3/408 (1970)

E. Specification dimension – Fifth level

Two categories: (1) Generic and (2) Specified; this distinction applies to services and processed goods, applies mostly to intermediate consumption, and could apply in a few cases as a distinction in processed goods for gross fixed capital formation

37. The specification dimension is new to the BEC. Its main purpose is to isolate trade in primary commodities and generic intermediates from trade in highly specified intermediates. This is useful because global value chains most prominently involve international transactions with some level of explicit coordination,¹⁶ rather than the arm's-length transactions underpinning more "traditional" trade. While researchers have developed *ad-hoc* lists of differentiated and highly specified products in the past,¹⁷ the specification dimension of BEC Rev.5 defines an official, internationally agreed upon list.

38. On the goods side, specified processed intermediates are highly dependent on the industry for which the goods are made, and are in some cases include parts and components produced according to the specific requirements of one or a small number of buyers, with a single or small number of downstream uses. For instance, most auto and aircraft parts and more highly integrated electronic components can be characterized as specified intermediate products. Even products made in large, standardized batches such as pharmaceuticals and in continuous process production methods such as chemical and plastic stock can be considered specific if they are protected by patents and produced according to a specified formula that others do not have access to for legal or technical capability reasons. Generic processed intermediate goods typically lie farther upstream in the value added chain (as depicted in Figure 3), have a wider applicability across industries, and are therefore more indicative of arm's length trade, rather than the explicitly coordinated trade making up the most dynamic portions of global value chains.

39. The designation of generic or specified is undertaken on a case-by-case basis and based on advice from industry experts, but also on lists of similar products in the literature. For example, Rauch (1999)¹⁸ identifies three product classes in SITC Rev.2: (i) homogeneous goods, which are traded on an organized exchange, (ii) reference priced goods with published prices, and (iii) differentiated goods without published prices. For the purposes of BEC Rev.5, generic intermediates can be associated with homogeneous and referenced priced goods, and specified intermediates with differentiated goods.¹⁹ Further, the specific intermediates identified by Sturgeon and Memedovic (2010) include many products but cover only three industry sectors and are not meant to be comprehensive. Also, the list of "parts and components" provided by

¹⁶ See Gereffi, Gary, John Humphrey, and Timothy Sturgeon. 2005. "The Governance of Global Value Chains." *Review of International Political Economy* 12 (1): 78–104

¹⁷ See, for example, Yeats, Alexander. 1998. "Just how big is global production sharing?" World Bank Policy Research Working Paper 1871, January, as well as the literature cited below.

¹⁸ See Rauch, James E. (1999). "Networks Versus Markets in International Trade," *Journal of International Economics* 48(1) (June 1999): 7-35

¹⁹ The specificity dimension is also similar to Harvard's Center for International Development index of "product complexity," which is calculated using the average diversity of countries that make a specific product, and the average ubiquity of the other products that these countries make (see atlas.cid.harvard.edu/about/glossary/).

Athukorala (2010)²⁰ with 525 six-digit HS commodities across a variety of industries can be a useful starting point.

40. Whereas the processing dimension of BEC Rev.5 is not generally applicable to services, the specification dimension does apply. Services can be usefully divided into specific intermediate services which are tailored to one or a small number of buyers in a single industry, and more generic intermediate services which might serve as intermediate inputs into any number of different industries. For example, sewerage services and other utilities are generic intermediate services while computer systems design services, software services, and architectural services are typically specified intermediate services. Designation of generic or specified services also needs to be undertaken on a case-by-case basis.

41. The distinction between imports and exports becomes important with the specification dimension of BEC Rev.5, since exports of specified goods and services indicates a certain level of dependent integration, whereas imports of specified goods and services indicates some level of control over the activities carried out in the global value chain, and either control over or proximity to innovation-related activities. Case study research suggests that enterprises that control and orchestrate the activities of the global value chain, while retaining control over product design, marketing branding, and retailing, earn much higher profits than most enterprises that act as suppliers in global value chain, as indicated by Linden et al, (2011)²¹. Such enterprises would tend to sit at the head of global value chains and import specified intermediate goods and services.

F. Durability dimension – Sixth level

Two categories: (1) Non-durable and (2) Durable; only applies to goods and only to final consumption; all goods for intermediate consumption are non-durable, and all goods for gross fixed capital formation are durable

42. As defined in the 2008 SNA²², the distinction between durable and non-durable goods is not based on physical durability as such. Instead, the distinction is based on whether the goods can be used once only for purposes of production or consumption or whether they can be used repeatedly or continuously. For example, coal is a highly durable good in a physical sense, but it can be burnt only once. A durable good is one that may be used repeatedly or continuously over a period of more than a year, assuming a normal or average rate of physical usage. A consumer durable is a good that may be used for purposes of consumption repeatedly or continuously over a period of a year or more.

²⁰ See Athukorala, Prema-Chandra (2010). “Production Networks and Trade Patterns in East Asia: Regionalization or Globalization?” Asian Development Bank, Working Paper Series on Regional Economic Integration, #56, August

²¹ See Linden, Greg; Kraemer, Kenneth; and Dedrick, Jason (2011). “Innovation and Job Creation in a Global Economy: The Case of Apple’s iPod” US Trade Commission. *Proceedings of the Joint Symposium of U.S.-China Advanced Technology Trade and Industrial Development*. Journal of International Commerce and Economics. May, pp. 223-240

²² See the 2008 SNA, Chapter 9, paragraph 42

43. A non-durable good would be better described as a single use good. For example, food and drink are used once only to satisfy hunger or thirst. Heating oil, coal or firewood can be burnt once only, but they are nevertheless extremely durable physically and can be stored indefinitely. Households may hold substantial stocks of so-called non-durables, such as many foodstuffs and fuel.

G. Specific combinations of the 6 dimensions

44. Whereas many combinations of the six dimensions of BEC Rev.5 can be constructed, not all of them will have any trade associated with them. For instance, the dimensions of processing and durability typically only apply to goods, although services activities embodied in the form of knowledge based capital, such as software, databases, research and development, artistic originals and mineral exploration also satisfy the durable criterion. By definition there will be only durable goods in fixed capital formation and all intermediate consumption will reflect non-durables, which is why for these end-use categories there will be no need to differentiate between durable and non-durable (as shown in Figure 2).

45. In summary, services do not apply to gross fixed capital formation. The processing dimension only applies to goods and only to intermediate and final consumption. Primary goods are not traded for end-use of gross fixed capital formation. The specification dimension applies mostly to intermediate consumption, and could apply in a few cases as a distinction in processed goods for gross fixed capital formation. Finally, the distinction of durable versus non-durable only applies to goods and only to final consumption. By definition, all goods for intermediate consumption are non-durable and all goods for gross fixed capital formation are durable.

46. Given that the six dimensions of BEC Rev.5 represent a fully revised classification, we have to explore over time how many of the combinations will actually be used in international trade. The annexes show the breakdown of BEC categories in terms of the corresponding classes of CPC and HS.

IV. The COMPILATION of the BEC

A. Coding of BEC Rev.5

47. The coding system of BEC Rev.5 is hierarchical and purely decimal. The classification consists of 6 levels as described in the previous section, namely the dimension of broad economic categories (with 8 categories), the product dimension (with 2 categories), the SNA end-use dimension (with 3 categories), the processing dimension (with 2 categories), the specification dimension (with 2 categories), and the durability dimension (with 2 categories). The basic categories of BEC are expressed as 6-digit codes, where each digit indicates the category at that dimension. Note that a 0 is used to indicate the non-applicability of that dimension. For instance, 111110 stands for a product which belongs to the category of “Agriculture, forestry, fishing, food, beverages, tobacco” and is a generic primary good for intermediate consumption. The 0 is added on the durability dimension, since durability is not applied as a distinction for intermediate products. Another example is 613102, which stands for a processed durable good for final consumption belonging to the category of “ICT, media,

computers, business and financial services”. The specification dimension does not apply to final consumption. Therefore, a 0 is entered in the fifth position of the BEC code.

48. For services, the dimensions of processing and durability do not apply and are therefore always indicated by a 0. For instance, the code 621010 stands for a generic service for intermediate consumption belonging to the category of “ICT, media, computers, business and financial services”. The full tree of BEC Rev.5 is given in Annex 1.

B. Distribution of the CPC services and HS goods categories across BEC main categories

Table 2. Breakdown of CPC and HS categories by top level BEC categories

BEC – Broad Economic Categories		CPC Services	HS Goods
Category 1	Agriculture, forestry, fishing, food, beverages, tobacco	178	972
Category 2	Mining, quarrying, refinery, fuels, chemicals, electricity, water, waste treatment	75	983
Category 3	Construction, wood, glass, stone, basic metals, housing, electrical appliances, furniture	224	1313
Category 4	Textile, apparel, shoes, jewelry, leather	88	895
Category 5	Transport equipment and services, travel, postal services	136	180
Category 6	ICT, media, computers, business and financial services	289	441
Category 7	Health, pharmaceuticals, education, cultural, sport	126	178
Category 8	Government, military and other	168	139
Total	All products	1284	5101

49. The distribution of the CPC services and HS goods categories by the broad economic categories of BEC Rev.5 is such that the classes of “Food and agriculture”, “Energy and mining”, “Construction and housing” and “Textile and footwear” contain (relatively) more goods than services, whereas “Transport and travel”, “ICT and business” and “Health and education” contain (relatively) more services than goods. “Government and other” contain the remaining goods and services, including confidential and otherwise unallocated trade. Table 2 gives a first indication of the distribution of the codes, which will be subject to revision as experiences in implementing BEC evolve.

C. Identification of the end-use categories

50. As mentioned earlier, the broad economic categories are built from the existing subheadings of the HS on the goods side, and the basic services categories of the CPC on the services side. For many products it will also be relatively simple to identify the subsequent end-use categories, as well as the additional dimensions (processing, specification and durability). However, whilst guidance in this respect is welcome, national differences in the use of certain

(dual use) products dictate that an overly prescriptive concordance relationship should be avoided. Instead countries are recommended, as far as is possible, and certainly for products that are economically important, to adopt the allocation approaches used by national accountants in constructing supply-use tables. Of course this presents additional challenges, as the product level of detail in supply-use tables is significantly less than that available in HS and CPC product classifications for trade statistics.

51. Two approaches can be used to bridge these differences. The first (bottom-up) is to build BEC up from the individual HS/CPC product categories and allocate the end-use using information gleaned from the national accounts. This may not fully align with the equivalent allocations used in supply-use tables (which in any case follow the SNA in defining trade flows²³, thus forming a point of departure between BEC and SNA supply-use end-use allocations). The second (top-down) is to work back from the end-use allocations seen in supply-use tables and impose these on BEC breakdowns – but care should be taken to ensure that this does not distort bilateral relationships.

V. RELATIONSHIP TO OTHER CLASSIFICATIONS

A. *Relationship to the Central Product Classification*

52. The Central Product Classification (CPC) is intended to be a standard classification of products. Its main purpose is to provide a set of product categories that can be utilized for the collection and presentation of statistics on production or trade of goods and services. CPC is a general-purpose classification. It provides a basis for recompiling basic statistics from their original classifications into a standard classification for analytical use. The CPC includes products that are an output of economic activity including transportable goods, non-transportable goods and services. The CPC in general follows the definitions of products within the SNA. It was developed to assemble and tabulate all kinds of statistics, such as production, intermediate and final consumption, capital formation, foreign trade and prices. They may refer to stocks, flows or balances, and may be compiled in the context of I-O tables, BOP statistics or other analytical presentations.

53. Given the fact that CPC products cover both goods and services, the broad economic categories of the BEC can be seen as a specific re-arrangement of the basic CPC classes. The BEC in this sense is an alternative grouping of the CPC. The overall breakdown between goods and services in BEC should coincide with the overall breakdown of goods and services in the CPC. The UNSD website²⁴ provides a full overview of all CPC codes (goods and services) with the BEC categories.

54. In practice, most countries use the extended balance of payments categories to classify traded services. The EBOPS gives a breakdown of the 12 main services components of the BOP, but is still not as detailed as the service categories of the CPC. The Task Force on International

²³ Notably with respect to the treatment of goods for processing and merchanting,

²⁴ See <http://unstats.un.org/unsd/trade/BEC/>

Trade Statistics has established a correlation table between EBOPS and CPC, which is available from its website²⁵.

B. Relationship to the Harmonized System

55. The HS classification is maintained by the World Customs Organization. Its main purpose is to classify goods crossing the border for import tariffs or for application of some non-tariff measures for safety or health reasons. The HS classification is revised on a 5-year cycle often introducing new commodity categories due to new technologies or splitting off of special interest categories, and deleting those categories with relatively low levels of trade. The most recent version of the HS took effect on 1 January 2012 and contains well over 5,000 subheadings. The next revision is scheduled to take effect on 1 January 2017.

56. The broad economic categories of the BEC include all sub-headings of the HS classification. Therefore, the total trade in terms of HS equals the total trade of the goods side of the BEC. As stated earlier with respect to allocate HS sub-headings to a specific end-use class, end-use is an empirical concept and should be further examined within the national context. The economically important traded goods which have a dual use should be more closely screened for correct application of the end-use category.

C. Relationship to the Standard International Trade Classification

57. The original SITC was designed in the 1950s as a tool for collection and dissemination of international merchandise trade statistics, which would help in establishing internationally comparable trade statistics. By its introduction in 1988, the HS took over as collection and dissemination tool, and SITC was from hereon used mostly as an analytical tool with a structure of sections, divisions and groups of commodities, that can clarify economic development. The distribution of trade by the main sections of the SITC is still used as an alternative analytical breakdown of trade in goods together with the breakdown by the main economic categories of the BEC.

D. Relationship to other standard classifications

58. COICOP is primarily designed to classify transactions undertaken by households that result in payables, that is to say, money paid or due for the acquisition of current and capital goods or of labour and other services, for the acquisition of financial assets or for the extinction of financial liabilities. More specifically, COICOP is used to classify only a single kind of outlay, namely, the individual consumption expenditures of households. The structure and content of the BEC is closely linked to the Classification of Expenditures according to Purpose, which consists of four purpose classifications, namely COFOG, COPNI, COICOP and COPP.

²⁵ See <http://unstats.un.org/unsd/trade/taskforce/methodology.asp>

- COFOG and COPNI are used to classify a range of transactions involving expenditures on final consumption, intermediate consumption, gross capital formation and capital and current transfers by general government and NPISHs respectively;
- COICOP is used to classify only a single kind of expenditure, namely, the individual consumption expenditures of households, NPISHs and general government
- COPP is used to classify intermediate consumption and capital expenditure of mainly non-financial and financial corporate enterprises

E. Relationship to earlier revisions

59. The relation between BEC Rev.4 and BEC Rev.5 has extensively been discussed in the section on historical background. It can be concluded that BEC Rev.5 differs significantly from the earlier revisions, because the broad economic categories have been fully separated from the end-use categories, services have been added to the product dimension and a new dimension on specification was added. Due to these significant changes a direct conversion from the fourth revision of the BEC to its fifth revision is not possible.

60. Based on the available (historical series of) statistics of trade in goods and services it should, however, be possible to reconstruct a historical series in terms of BEC Rev.5. For longer historical time series, a correlation table of BEC Rev.5 with earlier versions of the HS, CPC and EBOPS would need to be established, which is not provided in this manual. Those correspondence tables are provided on the website of UNSD. Because backwards correlations among older versions of classifications are necessarily imperfect, this implies that more estimates will need to be produced. Given the high aggregation level of the BEC, those estimates could still have high quality, but explanatory notes are needed on the way the estimates were created.

ANNEX 1: STRUCTURE OF THE BEC REV.5

Code	<i>BEC – Broad Economic Categories</i>
1	Agriculture, forestry, fishing, food, beverages, tobacco
11	Goods
111	Intermediate Consumption
1111	Primary
1112	Processed
111210	Generic
111220	Specified
112	Gross Fixed Capital Formation
112010	Generic
112020	Specified
113	Final Consumption
1131	Primary
113101	Non-durable
113102	Durable
1132	Processed
113201	Non-durable
113202	Durable
12	Services
121	Intermediate Consumption
121010	Generic
121020	Specified
123	Final Consumption
2	Mining, quarrying, refinery, fuels, chemicals, electricity, water, waste treatment
21	Goods
211	Intermediate Consumption
2111	Primary
2112	Processed
211210	Generic
211220	Specified
212	Gross Fixed Capital Formation
212010	Generic
212020	Specified
213	Final Consumption
2131	Primary
213101	Non-durable
213102	Durable
2132	Processed
213201	Non-durable
213202	Durable
22	Services
221	Intermediate Consumption
221010	Generic
221020	Specified
223	Final Consumption

Code	BEC – Broad Economic Categories
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3	Construction, wood, glass, stone, basic metals, housing, electrical appliances, furniture
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31	Goods
311	Intermediate Consumption
3111	Primary
3112	Processed
311210	Generic
311220	Specified
312	Gross Fixed Capital Formation
312010	Generic
312020	Specified
313	Final Consumption
3131	Primary
313101	Non-durable
313102	Durable
3132	Processed
313201	Non-durable
313202	Durable
32	Services
321	Intermediate Consumption
321010	Generic
321020	Specified
323	Final Consumption

4	Textile, apparel, shoes
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41	Goods
411	Intermediate Consumption
4111	Primary
4112	Processed
411210	Generic
411220	Specified
412	Gross Fixed Capital Formation
412010	Generic
412020	Specified
413	Final Consumption
4131	Primary
413101	Non-durable
413102	Durable
4132	Processed
413201	Non-durable
413202	Durable
42	Services
421	Intermediate Consumption
421010	Generic
421020	Specified
423	Final Consumption

Code	BEC – Broad Economic Categories
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5	Transport equipment and services, travel, postal services
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51	Goods
511	Intermediate Consumption
5111	Primary
5112	Processed
511210	Generic
511220	Specified
512	Gross Fixed Capital Formation
512010	Generic
512020	Specified
513	Final Consumption
5131	Primary
513101	Non-durable
513102	Durable
5132	Processed
513201	Non-durable
513202	Durable
52	Services
521	Intermediate Consumption
521010	Generic
521020	Specified
523	Final Consumption

6	ICT, media, computers, business and financial services
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61	Goods
611	Intermediate Consumption
6111	Primary
6112	Processed
611210	Generic
611220	Specified
612	Gross Fixed Capital Formation
612010	Generic
612020	Specified
613	Final Consumption
6131	Primary
613101	Non-durable
613102	Durable
6132	Processed
613201	Non-durable
613202	Durable
62	Services
621	Intermediate Consumption
621010	Generic
621020	Specified
623	Final Consumption

Code	BEC – Broad Economic Categories
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7	Health, pharmaceuticals, education, cultural, sport
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71	Goods
711	Intermediate Consumption
7111	Primary
7112	Processed
711210	Generic
711220	Specified
712	Gross Fixed Capital Formation
712010	Generic
712020	Specified
713	Final Consumption
7131	Primary
713101	Non-durable
713102	Durable
7132	Processed
713201	Non-durable
713202	Durable
72	Services
721	Intermediate Consumption
721010	Generic
721020	Specified
723	Final Consumption

8	Government, military and other
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81	Goods
811	Intermediate Consumption
8111	Primary
8112	Processed
811210	Generic
811220	Specified
812	Gross Fixed Capital Formation
812010	Generic
812020	Specified
813	Final Consumption
8131	Primary
813101	Non-durable
813102	Durable
8132	Processed
813201	Non-durable
813202	Durable
82	Services
821	Intermediate Consumption
821010	Generic
821020	Specified
823	Final Consumption
