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Synthesis and National Accounts Division - DSCN

Methodology of National Accounts of Colombia (Current years) 2005 Base

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ACRONYMS

ACUANAL	Asociación Nacional de Acuicultores de Colombia	National Association of Fish Producers of Colombia
ANALAC	Asociación Nacional de Productores de Leche	National Association of Milk Producers
ANDI	Asociación Nacional de Industriales	National Business Association of Colombia
ASOCAÑA	Asociación de Cultivadores de Caña de Azúcar de Colombia	Sugar Cane Producers Colombian Association
ASOPORCICULTORES	Asociación Colombiana de Porcicultores	Pigfarmers Colombian Association
AVIANCA	Aerovías Nacionales de Colombia	Aerovías Nacionales de Colombia
BANCOLDEX	Banco de Comercio Exterior de Colombia	Foreign Trade Bank of Colombia
BLS	Bureau of Labor Statistics	Bureau of Labor Statistics
BMC	Bolsa Mercantil de Colombia	Colombian Mercantile Exchange
BOU	Balance Oferta-Utilización	Supply and Use Balance
BP	Balanza de Pagos	Balance of Payments
CAR	Corporación Autónoma Regional de la Sabana de Bogotá y de los Valles de Ubaté y Chiquinquirá	Autonomous Regional Corporation of la Sabana de Bogotá, Valle de Ubaté and Chiquinquirá
CCI	Corporación Colombia Internacional	Corporación Colombia Internacional
CEED	Censo de Edificaciones	Building Census
CEGA	Corporación de Estudios Ganaderos y Agrícolas (Universidad de los Andes)	Corporation of Agricultural and Cattle Studies (Andes University)
CENDES	Centro de Proyectos para el Desarrollo - Universidad Javeriana	Center of Research Projects for Development - Javeriana University
CHIP	Consolidador de Hacienda e Información Financiera Pública	Finance and Public Financial Information Consolidation System
CI	Variación de Existencias	Change in Inventories
CNO-GAS	Comité Nacional de Operación y Consumo de Gas Natural	National Committee of Natural Gas Operation and Consumption
COICOP	Classification of Individual Consumption by Purpose	Classification of Individual Consumption by Purpose
COLCIENCIAS	Departamento Administrativo de Ciencia, Tecnología e Innovación	Administrative Unit of Science, Technology and Innovation
CONALGODÓN	Confederación Colombiana del Algodón	Cotton producers Colombian Confederation
CONIF	Corporación Nacional de Investigación y Fomento Forestal	National Corporation of Forestry Research and Promotion
CORPES	Consejos Regionales para la Planeación de la Educación Superior	Regional Councils for Higher Education Planning
COTELCO	Asociación Hotelera y Turística de Colombia	Hotel and Tourism Association of Colombia.
CPC	Clasificación Central de Productos	Central Product Classification
CPI	Índice de Precios al Consumidor	Consumer Price index
CS	Cuentas Satélites	Satellite Accounts
CVAN	Encuesta de Comercio de Vehículos Automotores Nuevos	Survey of New Vehicles Wholesale
DAAC	Departamento Administrativo de la Aeronáutica Civil	Administrative Department of Civil Aeronautics
DANE	Departamento Administrativo Nacional de Estadística	National Administrative Department of Statistics
DIAN	Dirección de Impuestos y Aduanas Nacionales	National Tax and Customs Bureau
DNP	Departamento Nacional de Planeación	National Planning Department

DSCN	Dirección de Síntesis y Cuentas Nacionales	Synthesis and National Accounts Division
EAC	Encuesta Anual de Comercio	Annual Survey of Commerce
EAM	Encuesta Anual Manufacturera	Annual Survey of Manufacturing
EAS	Empresas Encuesta Anual de Servicios	Service Enterprises Annual Survey
ECH	Encuesta Continua de Hogares	Continuous Household Survey
ECOPETROL	Empresa Colombiana de Petróleos	Colombian Petroleum Company
ECV	Encuesta de Calidad de Vida	Life Quality Survey
EMPUB	Empresas Públicas	Public Enterprises
ENA	Encuesta Nacional Agropecuaria	National Agricultural Survey
ENIG	Encuesta Nacional de Ingresos y Gastos	Incomes and Expenses National Survey
EPS	Entidad Promotora de Salud	Private Corporations in charge of the Administration of Social Security in Health
ER	Tasa de Cambio	Exchange rate
ESAG	Encuesta de Sacrificio de Ganado	Livestock Slaughter Survey
ESE	Empresas Sociales del Estado	Governmental Social Corporations
ETESA	Empresa Territorial para la Salud	Territorial Corporation for Health
EUROSTAT	Comisión de la Comunidad Europea	Statistical Office or the European Union
EVAS	Evaluaciones Agropecuarias por Consenso	Agricultural Valuations by Consensus
FASECOLDA	Federación de Aseguradores Colombianos	Colombian Insurers Federation
FCEG	Gastos de Consumo Final del Gobierno	Final Consumption Expenses of the Government
FCH	Consumo Final de los Hogares	Final Consumption of Households
FEDEARROZ	Federación Nacional de Arroceros	Rice Producers National Federation
FEDECACAO	Federación Nacional de Cacaoteros	Cacao Producers National Federation
FEDEGAN	Federación Colombiana de Ganaderos	National Federation of Cattle Producers
FEDEPALMA	Federación Nacional de Cultivadores de Palma de Aceite	Oil Palm Producers National Federation
FENAVI	Federación Nacional de Avicultores	National Federation of Poultry Producers
FINDETER	Financiera de Desarrollo Territorial S.A.	Financial Corporation of Territorial Development
FISIM	Servicios de Intermediación Financiera Medidos Indirectamente	Financial intermediation services indirectly measured
FOSYGA	Fondo de Solidaridad y Garantía del Sistema General de Seguridad en Salud	Solidarity and Guarantee Fund of the Social Security System in Health Care
GAHM	Encuesta a Grandes Almacenes e Hipermercados y Minoristas	Retail Stores and Hypermarkets Survey
GDP	Producto Interno Bruto	Gross Domestic Product
GEIH	Gran Encuesta Integrada de Hogares	Integrated Household Survey
GFCF	Formación Bruta de Capital Fijo	Gross Fixed Capital Formation
GMF	Gravamen a los Movimientos Financieros	Financial Transactions Tax
Ibope	Instituto de Investigación y Sondeos de Opinión	Research and Opinion Survey Institute
IC	Consumo Intermedio	Intermediate Consumption
ICCP	Índice de Costos de la Construcción Pesada	Heavy Construction Cost Index
ICCV	Índice de Costos de la Construcción de Vivienda	Dwelling Construction Cost Index
ICFES	Instituto Colombiano para el Fomento de la Educación Superior	Colombian Institute for the Promotion of Higher Education

ICONTEC	Instituto Colombiano de Normas Técnicas	National Standardization Body of Colombia
IDEAM	Instituto de Estudios Ambientales y Meteorológicos	Institute of Environmental and Meteorological Studies
IFI	Instituto de Fomento Industrial	Institute of Industrial Promotion
IIOC	Indicador de Inversión en Obras Civiles	Investment Indicator in Civil Works
IMF	Fondo Monetario Internacional	International Monetary Fund
INCO	Instituto Nacional de Concesiones	National Concessions Institute
INCODER	Instituto Colombiano de Desarrollo Rural	Colombian Institute of Rural Development
INCORA	Instituto Colombiano para la Reforma Agraria	Colombian Institute for Agricultural Reform
INGEOMINAS	Instituto Colombiano de Geología y Minería	Colombian Institute of Geology and Mining
INVIAS	Instituto Nacional de Vías	National Roads Institute
IPS	Instituciones Prestadoras de Salud	Health Care Provider Institutions
ISA	Interconexión Eléctrica S. A.	Interconexión Eléctrica S.A.
ISIC A.C.	Clasificación Industrial Internacional Uniforme Adaptada para Colombia	International Standard Industrial Classification adapted to Colombia
ITI	Indicador Trimestral Integrado	Integrated Quarterly Indicator
KITCO	Comercializador internacional de metales y fuente de información de mercados	International Trader of metals and market information source
MADR	Ministerio de Agricultura y Desarrollo Rural	Ministry of Agriculture and Rural Development
MCF	Millares de Unidades Térmicas Británicas	Thousands of cubic feet
MECI	Modelo Estándar de Control Interno	Standard Model of Internal Control
MMCM	Muestra Mensual de Comercio al por Menor	Monthly Survey of Retail Stores
MMM	Muestra Mensual Manufacturera	Monthly Survey of Manufacturing
MTS	Muestra Trimestral de Servicios	Quarterly Services Survey
NEDD	Normas Especiales para la Divulgación de Datos	Special Guidelines for Data Dissemination
Npc	No clasificado en otra parte	Not previously classified
NPISH	Instituciones sin Fines de Lucro que Sirven a los Hogares	Non-profit Institutions Serving Households
NSS	Sistema Estadístico Nacional	National Statistical System
OCDE	Organización para la Cooperación Económica y el Desarrollo	Organization for Economic Co-operation and Development
OMT	Organización Mundial del Turismo	World Tourism Organization
OPEC	Operaciones Especiales de Comercio Exterior	Special Operations of Foreign Exchange
PAHO	Organización Panamericana de la Salud	Pan American Health Organization
PII	Posición de Inversión Internacional	International Investment Position
PPI	Índice de Precios al Productor	Producer Price Index
PUC	Plan Único de Cuentas	Accounting Standards Framework
QNA	Cuentas Nacionales Trimestrales	Quarterly National Accounts
SDI	Sistema Documental Institucional	System of Institutional Documentation
SEN	Sistema Estadístico Nacional	National Statistical System
SERVIENTREGA	Empresa de logística en recolección, transporte, almacenamiento, empaque y distribución de documentos y mercancías.	Logistics Company for the collection, transport, storage, packaging and distribution of documents and merchandise.
SFC	Superintendencia Financiera de Colombia	Superintendency of Finance
SGC	Sistema de Gestión de Calidad	Quality Management System

SGP	Sistema General de Participaciones	System of General Participation
SIG	Sistema Integrado de Gestión	Integrated System of Management
SIGI	Sistema Integrado de Gestión Institucional	Integrated System of Institutional Management
SIGOB	Sistema de Información del Gobierno	Government Information System
SIIF	Sistema Integrado de Información Financiera	Integrated System of Financial Information
SIPSA	Sistema de Información de Precios del Sector Agropecuario	Agricultural Sector Prices Information System
SISAC	Sistema de Información del Sector Agropecuario Colombiano	Colombian Information System for the Agricultural Sector
SISBEN	Sistema de Identificación de Potenciales Beneficiarios de Programas Sociales	Identification System of Social Programs Potential Beneficiaries
SISOC	Superintendencia de Sociedades	Superintendency of Companies
SISOL	Superintendencia de Economía Solidaria	Superintendency of Solidarity Economy
SIVAL	Superintendencia de Valores	Superintendency of Securities
SNA	Sistema de Cuentas Nacionales	System of National Accounts
SOAT	Seguro Obligatorio de Accidentes de Tránsito	Traffic Accidents Compulsory Insurance
SSP	Superintendencia de Servicios Públicos	Superintendency of Public Utilities
SSPD	Superintendencia de Servicios Públicos Domiciliarios	Superintendency of Domiciliary Public Utilities
SUI	Sistema Único de Información	Information System for the Public Utility Sector
TAN	Territorio Aduanero Nacional	National Customs Territory
TELECOM	Empresa Nacional de Telecomunicaciones	National Telecommunications Company
TPM	Tasa Punto Medio	Midpoint Rate
UEPS	Ultimas en Entrar, Primeras en Salir	Last in, first out
UGG	Unidades de Gran Ganado	Large Livestock Units
UN	Organización de las Naciones Unidas	United Nations
UNESCO	Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura	United Nations Educational, Scientific and Cultural Organization
UPC	Unidad de Pago por Capitación	Capitation Payment Unit
UPME	Unidad de Planeación Minero Energética	Unit of Mining-Energy Planning
VA	Valor Agregado	Value Added
VAT	Impuesto al Valor Agregado	Value Added Tax
WB	Banco Mundial	World Bank

INTRODUCTION

A time series of national accounts generally integrates the accounts of a base year and those of current years. The purpose of the accounts of the base year is to establish the levels and structures of the system that then serve as a reference for the subsequent annual accounts. The base year is thereby a year for which all efforts are dedicated to calculate, in absolute values, all variables and accounts of the system, simultaneously with the revision and update of the definitions, concepts, classifications and compilation methods of the previous base. They are the point of reference used to construct the series of accounts for the following years and the previous years by back casting. The present series of Colombian annual, quarterly, regional and satellite accounts are established taking year 2005 as a reference.

The purpose of the current years' accounts is to establish the changes in the economy from one year to the other, while maintaining as much as possible the methodological aspects unchanged. They also show the structural transformations that may arise within the economy during a period of time, provided that data are comparable among the years and with those calculated for the base year. This implies significant differences in the calculation methods with regard to the accounts of the base year since, more than evaluating the level of the variables of the system, emphasis is placed on describing accurately the changes that have occurred. Therefore, effort is made to maintain the same sources of information or similar sources throughout the entire series, in order to avoid breakups in the series that would only be attributable to changes in data sources and in the compilation methods.

For an important part of the system, especially the goods and services accounts, the current accounts are constructed based on the changes over time in the values of the variables. This means that the values corresponding to the current years are estimated on the basis of the level that was established for the base year; for this purpose, value, volume and prices indicators are used. In other cases, assumptions are used regarding, for instance, the relative stability overtime of certain costs structures or of the distribution of operations; it is what occurs in the case of the technical coefficients of the intermediate consumption matrix; the technical coefficients assessed for the base year are the starting point for the estimation of the coefficients corresponding to current years, checking that the estimated changes in patterns accurately reflect the gradual changes in the production techniques.

For some sectors, complete information is available every year and for these, the series of accounts are produced (in level) with the same methodology as for the base year. This is the case of the accounts of the financial corporations, those of the government and part of the non-financial corporations (those with complete accounting information). However, even in those cases, data must be checked to ensure that they properly reflect actual changes and that they are not due, for example, to alterations in the accounting systems used by agents, or to different interpretations of the data.

Each of the topics addressed in the present document is organized as follows: there is first a presentation of the conceptual aspects; then, the sources of information used are introduced; then the compilation methods are presented and finally the stages followed in

order to produce the accounts are described. The methodological developments are illustrated using figures corresponding to the basic information.

The document is divided into chapters that in turn are grouped into 4 parts.

The first part (Chapter 1), is dedicated to general aspects, starting with the background, the objectives of national accounts, the reference framework, the conceptual bases and the classifications used.

The second part (Chapters 2 to 7) presents the goods and services accounts, as follows: Chapter two explains their content and mode of presentation (the commodity flow balances of products and the supply and use table); Chapter three provides the accounts calculated at 2005 constant prices by chaining; Chapters four to six explain the process followed each year in order to calculate transactions on goods and services (production, household final consumption expenditure, imports, exports, gross fixed capital formation, and changes in inventories) and describes how the synthesis of goods and services is carried out; and Chapter seven explains the method followed for obtaining the values at 2005 constant prices by chaining, once the goods and services accounts are balanced at current and at previous year's constant prices.

The third part (Chapters 8 to 14) presents the accounts of the institutional sectors. Chapter 8 provides the definitions of institutional units, and institutional sectors and subsectors; it also presents the accounts, the principles under which they are compiled and their purposes; Chapter 9 explains the general methodology used to compile the accounts of the institutional sectors, the sources of information used and the relationship between business accounting and national accounting; Chapters 10 to 13 highlight the methodology used to compile the accounts for each of the resident institutional sectors and specifically those of general government, financial corporations, insurance corporations, pension funds, non-financial corporations, non-profit institutions serving households (NPISHs), as well as the estimation of the Financial Intermediation Services Indirectly Measured (FISIM); finally, Chapter 14 presents the accounts of the rest of the world.

The fourth part (Chapter 15) presents the integrated economic accounts; it describes the methodology used to design transactions matrices and the process followed to carry out the general synthesis of accounts, which is the final stage of the compilation process of the annual national accounts.

Annexes provide further insight on classifications, and details on the sources of information, the methods and indicators used to calculate production, household final consumption expenditure, imports and exports. Finally the glossary defines the terminology and variables used in national accounts.

BACKGROUND

Colombia has a long experience in national accounting, beginning in 1947 in the Central Bank as a project that included the calculation of national income, the balance of transactions with the rest of the world and the presentation of the income and national product tables for the 1945-1948 period.

In 1960, the Central Bank published the national accounts, for the 1950-1959 period adopting the methodology and definitions recommended at that time by the United Nations[1]. The estimations at constant prices were made using the prices of 1958 as reference.

Subsequently, the Central Bank published the 1950-1967 series, under the methodological framework of the System of National Accounts, SNA 1953 or UN revision 2. This series included the consolidated production, consumption, accumulation and current external transactions accounts. The main focus was the measurement of Gross Domestic Product (GDP) and of National Income.

With the publication of *National Accounts 1970-1975*[2], the Central Bank introduced changes to its methodology and explained, in light of the results, the performance of the national economy. The most relevant change was the rebasing of its price references from year 1958 to year 1970. The Central Bank continued publishing the national accounts officially until 1982, according to this methodology.

As part of the institutional reforms of the second half of the 1960´s, DANE was conferred the responsibility for the compilation of the national accounts of Colombia (real sector accounts), whereas the Central Bank was in charge of their financial part. In 1983, DANE took over the responsibility for compiling the official national accounts, once a whole series of accounts was available (1970-1980). Since then, DANE has compiled four series of accounts, with the following base years: 1975, 1994, 2000 and the most recent one, 2005.

The compilation of the 1958 base and the 1970 base national accounts by the Central Bank followed the international recommendations of SNA Rev. 1 and Rev. 2 issued by the United Nations. They focused exclusively on the presentation of global GDP in fourteen activities, as well as on the consolidated accounts of the Nation. As DANE undertook the compilation of the national accounts, it enacted a fundamental methodological turn, implicit to the application of most of the recommendations included in SNA 1968 (or Rev. 3).

DANE´s National Accounts 1975 base used these recommendations as a reference, whereas the 1994 and 2000 bases used the SNA 1993, which expanded the concepts introduced in SNA 1968. The 2005 base preserved the methodological aspects of SNA 1993, though adding some of the SNA 2008 recommendations; the whole system was not adopted, partly due to the delayed availability of the final version of this recommendation.

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[1] ST/STAT/SER.F/2 REV.1

[2] Camacho, M. José A. (mayo 1978). Nueva serie de las Cuentas Nacionales de Colombia. En: Revista Banco de la República, vol. 51, No. 607. /(May 1978). Colombian New Series of National Accounts: Revista Banco de la República (Central Bank Journal, vol. 51, No. 607.

The transfer of the responsibility for the compilation of the national accounts to DANE brought about a profound turnaround with respect to the scope of these accounts, such as the establishment of complete products and activities accounts, including commodity flow balances broken down by products, the supply and use tables, the institutional sectors accounts including financial accounts, whose compilation was under the responsibility of the Central Bank. Furthermore, the study of productive activities was expanded from fourteen (14) to thirty-three (33) industries, and currently to sixty one (61) (2005 base) and the related production and intermediate consumption were calculated for each industry. In addition, the economic activity was analyzed at the product level (initially with 250 products and now 361) for which the supply (production plus imports) and use (intermediate consumption, final consumption expenditure, gross capital formation and exports) balance is established, and demand and supply are reconciled both at the level of products as that of activities through intermediate consumption and production matrices. And finally, independent accounts were compiled for resident institutional sectors: financial corporations, non-financial corporations, general government and households.

In the 1994 base, the accounts of the institutional sectors were strengthened, the production was valued at basic prices, the concept of Gross Fixed Capital Formation (GFCF) was expanded and the activity of the illegal sector was included[3]. In GFCF, the expenditure on mining exploration, computer software and new developments in entertainment, literary and artistic works were taken into consideration.

The 2000 base maintained the conceptual aspects of SNA 1993, which had been adopted in the 1994 base adding some methodological changes regarding how to measure the production of the Central Bank (as a non-market production) as well as the allocation of the produced FISIM to users. Also, changes were made regarding how to account for the operations of the illegal economy and in the recording of transactions related to Health Care and Social Insurance, which had undergone important structural changes as a result of the enactment of Law 100 of 1993[4], which created the so-called Integrated Social Security System.

For the 2005 base accounts, the conceptual aspects of SNA 1993 which had been adopted for the 1994 and 2000 bases were currently maintained. Nevertheless, some changes were introduced such as the calculation of the accounts at constant prices, moving from a system using a fixed base year as reference into a system by chaining; the treatment of employment through temporary employment agencies; the treatment of taxes on financial movements (GMF), recommendations which were already present in SNA 1993 but had not been implemented and finally the inclusion of the SNA 2008 recommendations regarding the accounting of expenditure on military equipment as capital formation and the treatment of the various pension systems.

From a practical perspective, the 2005 base has meant improvements in the compilation methods of variables, among which: i) changes in how FISIM is calculated and assigned among industries and institutional sectors, household final consumption expenditure (use

[3] For more information on the recommendations of the SNA 1993 incorporated in base 1994, refer to: “Metodología de las Cuentas Nacionales de Colombia – Base 1994”. -Operaciones de bienes y servicios, capítulo 1./ “Methodology of the National Accounts of Colombia - base 1994. Operations on goods and services, Chapter 1.

[4] For more information on the changes incorporated in base 2000, see: DANE. (2009). “Metodología de las Cuentas Nacionales de Colombia, año base 2000, tomo 1”, - Alcances del año base. pág. 24. / “Colombian Methodology of National Accounts, accounting base 2000, volume 1”, - Scopes of the accounting base and methodological changes base 2000 on Page 24.
www.dane.gov.co/files/investigaciones/pib/anuales/cambios-metodologicos-base-2000.pdf.

of direct information) and changes in inventories; ii) in the measurement of agriculture: the calendar year is adopted to measure the production of transitory crops instead of the crop year, in order to improve the consistency of measurements with the other economic activities; iii) data on smuggling were revised as a joint project with the National Tax and Customs Bureau (DIAN), results that were validated with information on supply and use of products; and, iv) a new calculation was made for the production of the stock of buildings and rental of dwellings[5], etc.

Furthermore, a significant change in the compilation methods *per se* was introduced, favoring the analysis of the variables in series, as opposed to previous bases in which the analysis was performed within a year to year perspective, without further reference to any longer-term vision.

[5] For more information about the changes of the 2005 base refer to: "Cuentas Nacionales Base 2005. Principales cambios metodológicos y resultados". DANE 2011. Colección Documentos – Actualización 2011. No 100. ISSN 0120-7423/National Accounts 2005 base. "Main methodological changes and results " DANE 2011. Documents collection- Updated 2011.

OVERVIEW

PART 1. DESCRIPTION OF NATIONAL ACCOUNTS

1.1. OBJECTIVES OF NATIONAL ACCOUNTS

1.1.1. General objective

National Accounts enable economic data to be compiled and presented in a format that is adjusted to the needs of economic analysis, decision-making and the formulation of economic policy.

1.1.2. Specific Objectives

a. To present the general economic situation of the country:
Changes of aggregates in terms of value and the measurements related to changes both in prices and volumes are used to evaluate the general performance of the economy.

b. To provide a thorough description of the evolution of the economic activity over time:
Annual National Accounts provide information about different economic activities and sectors. It makes it possible to monitor the flows of main transactions such as production, household final consumption expenditure, government consumption, gross capital formation, exports, imports, compensation of employees, etc.; furthermore, it provides detailed information on significant balancing items such as saving, disposable income, net lending in global terms and by large categories of economic agents.

c. To provide macroeconomic data suitable for the analysis and evaluation of the performance of the economy:
National accounts data are used to examine the causal mechanisms operating within an economy. As the accounts are complete and integrated, the effects of an economic measure through the entire economic network can be seen and tracked, including (potentially) those relating to net worth[6].

d. To support the formulation of economic policy and decision-making:
Short- and long-term economic policies are formulated on the basis of the analysis of the economic behavior that the national accounts enable to observe. In order to carry out sectoral analysis and to apply their macroeconomic models, both businesses and government require detailed information provided by national accounts.

e. To facilitate international comparability:
National accounts are used to perform international comparisons of the changes of the main aggregates over time, such as GDP or GDP *per capita* as well as of structural measurements, such as the share of investment, taxes or public spending to GDP. It also enables evaluating and comparing the role of government in the regulation and distribution of wealth and in the provision of individual services such as health care, education, social protection, etc.

f. To provide a reference framework for statistical coordination:

[6] A part of the system of national accounts that still has not been developed in Colombia.

In addition, national accounts represent a coordinating framework for economic statistics, which justifies their compilation by the entity in charge of the production and regulation of statistics. As a conceptual framework, they ensure the consistency of the definitions and classifications used in different statistical fields, and as an accounting framework they guarantee the numerical consistency of data coming from different sources, such as economic surveys, financial statements of corporations, household surveys, foreign trade statistics, and other administrative sources.

g. To serve as a guide for the development of the National Statistical System (NSS):
The compilation of the national accounts helps with identifying information gaps, promoting new research initiatives, supporting the revision and redesign of the existing ones, in order to respond in a timely, coherent and consistent manner to the needs of economic analysis. "The needs of information of National Accounts represent an essential component for the design of strategies for national statistical systems development[7]".

1.2. REFERENCE FRAMEWORK

- **International Recommendations.** Colombian 2005 base national accounts follow the conceptual and methodological framework established by international organizations namely SNA 1993 and SNA 2008.

These recommendations were prepared under the auspices of the Inter-Secretariat Working Group on National Accounts, consisting of five organizations: the Statistical Office of the European Communities (Eurostat), the World Bank, the International Monetary Fund (IMF), the Organization for Economic Cooperation and Development (OECD), the United Nations Statistics Division and its regional commissions for Latin America and the Caribbean, for Europe, for Asia and the Pacific, for Africa, for Western Asia and the collaboration of countries.

The System of National Accounts 2008 (SNA 2008) maintains the same basic theoretical framework as that of SNA 1993, but incorporates new methodologies and enhances the scope on a wide range of issues as a consequence of changes in the economies (in particular the development of financial innovations, the increasing interaction of the economies, the increasing concern of governments for the systems of social protection) as well as in the evolving needs of its users.

- **Legal and Institutional Framework.** As a consequence of the reorganization of DANE in 1969, the entity was assigned the responsibility of compiling and disseminating the National Accounts (real sector accounts), whereas the responsibility for compiling the financial accounts was assigned to the Central Bank. Since 1983 to date, DANE periodically publishes the national accounts and the Central Bank continues compiling the national financial accounts.

Legislative Decree 262 of January 28, 2004 modified DANE´s structure and assigned to the entity the following functions related to the synthesis of national accounts:

[7] Las Cuentas Nacionales: lineamientos conceptuales, metodológicos y prácticos. CEPAL Serie Manuales No 54. Julio de 2007, página 9./ National Accounts: Conceptual, methodological and practical guidelines. CEPAL Serie Manuales No 54. July 2007, page 9.

- To elaborate the annual, quarterly, regional and satellite accounts in order to evaluate the national and regional economic growth globally and by sectors.

- To elaborate and adapt the methodologies of synthesis and national accounts to the conditions and characteristics of the country, following the international recommendations.

- To promote the training and dissemination of the System of synthesis and national accounts among both producers and users of macroeconomic statistics.

1.3. CONCEPTUAL FRAMEWORK

SNA 2008 supports the compilation and presentation of economic data in a format that is designed for economic analysis, decision-making and the formulation of economic policies. The framework comprises accounts that are comprehensive, consistent and integrated. "The accounts themselves present in a condensed way a great mass of detailed information, organized according to economic principles and perceptions, about the working of an economy. These accounts constitute a comprehensive and detailed record of the complex economic activities that take place within an economy and of the interaction among various economic agents, and groups of agents, that takes place on markets or elsewhere"[8].

"The SNA measures what takes place in the economy, between which agents, and for what purpose. At the heart of the SNA is the production of goods and services. These may be used for consumption in the period to which the accounts relate or may be accumulated for use in a later period. In simple terms, the amount of value added generated by production represents GDP. The income corresponding to GDP is distributed to the various agents or groups of agents as income and it is the process of distributing and redistributing income that allows one agent to consume the goods and services produced by another agent or to acquire goods and services for later consumption. The way in which the SNA captures this pattern of economic flows is to identify the activities concerned by recognizing the institutional units in the economy and by specifying the structure of accounts capturing the transactions relevant to one stage or another of the process by which goods and services are produced and ultimately consumed"[9].

The SNA includes the central framework and the satellite accounts[10]. The central framework records the economic transactions and the corresponding net worth.

The 2005 Colombian national accounts correspond, in general terms, to the central framework as defined above. However, it only describes the economic transactions between agents but does not extend to the description of net worth. It includes the goods and services accounts, the institutional sectors accounts and the integrated economic accounts from which the main macroeconomic aggregates are deduced.

[8] SNA 2008 paragraph 1.1
[9] SNA 2008 paragraph 1.6
[10] The satellite accounts are presented in SNA 2008 paragraph 1.3.5.

1.3.1. The aggregates

The economic aggregates "are summary indicators and key magnitudes for purposes of macroeconomic analysis and comparisons over time and space"[11]. They are composite values which summarize the result of the economic activity considered from a particular point of view and derive from the consolidation of the system; examples are Gross domestic product (GDP), national income, national disposable income, consumption, saving, gross fixed capital formation (GFCF), net lending or net borrowing and among them, the government budget deficit. Nevertheless, it is important to highlight that national accounts go beyond the compilation of the macroeconomic aggregates and that most of their interest resides in providing a detailed description of the elements from which these aggregates are derived.

1.3.2. The goods and services accounts

The goods and services accounts combine two perspectives: that of the units of production (establishments), and that of the products: for units of production, production and costs related to the productive activity (intermediate consumption, taxes on production, and compensation of production factors) are determined, and for products, the origin of supply and the demand components are established. These accounts are integrated within the supply and use tables of goods and services.

The goods and services accounts are elaborated at current prices and at previous year's constant prices, from which calculations at 2005 prices by chaining are derived.

1.3.3. The sequence of accounts of the institutional sectors

In institutional sectors, the basic unit is the institutional unit defined as "an economic entity that is capable, in its own right, of owning assets, incurring liabilities and engaging in economic activities and in transactions with other entities[12]"; They have the legal responsibility of the decisions they make, have complete accounting records of their income and expenses, as well as a complete bookkeeping system to record their assets and liabilities.

The institutional units are grouped together into institutional sectors on the basis of the similarity of their economic behavior, function, and main source of income.

The SNA defines five resident institutional sectors:

1. Non-financial corporations
2. Financial corporations
3. General government
4. Households
5. Non-Profit Institutions serving households (NPISHs)

Additionally, the accounts include those of the rest of the world, which bring together all the transactions between resident and non-resident institutional units.

The basic identity of the national accounts between the supply of goods and services in the economy and their uses "is elaborated within the SNA into a sequence of interconnected flow accounts linked to different types of economic activity taking place

[11] SNA 1993, paragraph 2.169
[12] SNA 1993, paragraph 4.2

within a given period of time, together with balance sheets that record the value of stocks of assets and liabilities held by institutional units or sectors at the beginning and end of the period[13]. Each flow relates to a particular kind of activity, such as production, or the generation, distribution, redistribution or use of income. Each account shows the resources available to the institutional units and the uses they make of these resources. Accounts are balanced by introducing a balancing item, defined residually as the difference between the total resources recorded on one side of the account and the total uses recorded on the other side. The balancing item from one account is carried forward as the first item in the following account, on the opposite side, thereby making the set of accounts an articulated whole […]. Examples of balancing items include value added, disposable income and saving. "There is also a strong link between the flow accounts and the balance sheets, as all the changes occurring over time that affect the assets or liabilities held by institutional units or sectors are systematically recorded in one or another of the flow accounts"[14].

The accounts are classified in three main categories: current accounts, accumulation accounts and balance sheets. These accounts are presented in the integrated economic accounts.

1.3.4. The financial accounts

The financial accounts are part of the accumulation accounts. They record the transactions on assets and financial liabilities between resident institutional units and between those and the rest of the world. From these accounts, it is possible to determine the type of financial instruments used by institutional sectors in order to satisfy their financing needs (net borrowing) or dispose of their surplus (net lending).

The financial accounts are compiled by the Central Bank in coordination with DANE, who is in charge of the compilation of the non-financial accounts. For the construction of financial accounts, the same concepts, definitions and sources of information as those used for non-financial accounts are applied. Consequently, the results obtained should be coherent, since any non-financial transaction has a counterpart, whether a non-financial or a financial transaction; the same applies for a financial transaction whose counterpart can be whether financial or non-financial. Inconsistencies though are still turning up which are due to both the lack of coherence of the existing data (adjustments in accounting data without the possibility of tracking them in the analysis, etc.) and the difficulty in obtaining a total coherence in the treatment of information.

The set of the national accounts prepared by DANE and those of the financial accounts prepared by the Central Bank, represent as a whole the SNA transactions accounts as defined internationally.

1.3.5. The satellite accounts

The so-called satellite accounts are accounts "annexed" to national accounts, focusing on a specific domain of the socio-economic sphere.

In Colombia, the satellite accounts for environment, tourism, culture, health care (health care and health care social insurance) have already been institutionalized. Others are in process, such as those related to the agro-industry, pensions and care economy.

[13] Note that for the time being, there are not balance sheet accounts in the Colombian accounts
[14] SNA 2008 paragraph 1.14

They are called “Satellites” because they share with national accounts (designated as the “core framework”) most of their analysis and recording principles. Nevertheless, their compilation enables a flexible, but controlled application of these principles, to be adapted to each specific case. This means that, unlike the national accounting central framework in which there must be a total uniformity of treatment in all parts of the system, in a satellite account it is possible to propose a specific treatment that would not necessarily be relevant for all the system. For instance, education in health care can be included both in the health care satellite account as a connected activity and in the education satellite account as a characteristic education activity; the production boundaries used in the accounts of the health care economy are different from those used in the national accounts, since they also include the production of health care services carried out within the same household that are not included within the production boundary of national accounts: or the treatments of taxes (or tax exemptions) may be treated differently in the culture accounts and in the central framework, etc.

The French were the first ones in compiling systematically these accounts in the early 1980´s; the practice was formally institutionalized, and satellite accounts are now internationally recommended as mentioned in SNA 1993 and SNA 2008.

There is a vast variety of possible satellite accounts, in which the relationship with the core accounts is more or less strict.

There are functional accounts or accounts for key sectors, with a relatively strict relationship with the concepts of the central system, with a few divergences and few new concepts. It is the case of the tourism, transport, health care, and culture satellite accounts or of those related to key productive sectors (coffee, agro-industry…).

There are other accounts, however, with more innovating concepts. Such is the case of environment, time use, human capital, etc., in which the production boundaries are modified, the scope of the records is extended (for example, in the environmental accounts, externalities are also accounted for) or an expenditure on health care or education is considered as capital formation (accounts of human capital, etc.).

The satellite accounts can also propose changes in the classifications used, by focusing on products and activities with more relevance to their specific field (products and characteristic activities), but also introducing new dimensions, such as that of the beneficiaries of expenditure (as in the case of culture and health care satellite accounts).

A priori, the central framework allows each country to compile and tailor freely its satellite accounts. Nevertheless, in certain fields, accepted standards have been internationally established in order to ensure the comparability of results. In the case of tourism, the United Nations World Tourism Organization (UNWTO), in collaboration with other international organizations, has developed specific recommendations; in the case of culture, the Andres Bello Agreement has elaborated a set of standard tables in the form of accounts for its member countries, whereas the United Nations Educational, Scientific and Cultural Organization (UNESCO) has also set a series of indicators, though not totally integrated; in the field of health care, the Organization for Economic Co-operation and Development (OECD) has laid down a framework of accounts for health care, that was also adopted by the World Health Organization (WHO) and the Pan American Health Organization (PAHO); finally, for environment and care economy there are recommendations of the United Nations.

In general terms, the key points of differences between the satellite accounts and the central framework are as follows:

- The inclusion of non-monetary variables
- The classifications of products and activities
- The production boundary
- The treatment of externalities
- The treatment of ancillary activities
- The treatment of taxes and subsidies
- The borderline between consumption and capital formation: human capital and durable goods
- The emphasis on expenditure considered within a functional approach, and the identification of the final beneficiaries of expenditure.

In theory, data with common coverage between the central framework and the Satellite Accounts (SA) should be similar in both systems: this is the ideal situation which should be reached through an approximation process. In a first stage (case of Colombian Tourism Satellite Accounts 2000 and Culture Satellite Account 2000-2007), this was artificially achieved by setting most of the Satellite Account data as a breakdown of the central framework data. However, it is more complete (more respectful of the specificity of the domain of study) to make a new estimation from data specifically produced and analyzed for this purpose; due to the reduced economic importance of certain domains (as is the case of culture), the scarcity of direct information (as is the case of health care) or by the difference in approach (as is the case of tourism), it is possible that the domain may not be well measured in the central framework; subsequently, a process of reconciliation should be undertaken, in order to integrate the new knowledge and improve the central framework; a process that may require an adjustment of national accounts as they are currently estimated[15].

The satellite accounts are the object of particular studies and publications. Currently, the data on tourism and environment satellite accounts are globally consistent with the new 2005 base. In the case of the other satellite accounts, data are currently under an updating process.

1.4. CLASSIFICATIONS USED IN NATIONAL ACCOUNTS

Classifications are of vital importance in national accounts, as they guarantee the homogeneity of treatments, the organization of results, and determine the content of the components of the system. In order to collect and integrate the information obtained from different sources in the system, it is necessary to convert them into a common language.

National accounts use classifications for products, economic activities, transactions and other changes in the value of assets, liabilities, purpose of expenditure and institutional sectors. These classifications are presented in the following sections.

[15] In this line, a project is underway in order to incorporate improvements resulting from the Satellite accounts into the annual national accounts.

1.4.1. Classifications of activities and products

The construction of goods and services accounts use a classification of activities and a classification of products derived from the International Standard Industrial Classification of All Economic Activities (ISIC) Rev. 3 for activities and from the Central Product Classification (CPC) ver. 1.0 for products respectively, both adapted for Colombia (A.C). Due to historical reasons, the classification used in the Colombian national accounts present some differences with respect to the official classifications of productive activities and products, hence, tables of equivalence have been established between the classifications used in the national accounts and the national official classifications. In the future, once the CIIU Rev. 4 AC and CPC ver. 2.0 AC classifications have been implemented in the surveys, there will be an update of the classification of National Accounts and a more radical alignment on these classification principles.

- **Classification of Economic Activities**. The classification of economic activities identifies production processes and is intended to organize the productive establishments according to their main economic activity. The classification defined in the 2005 base follows roughly the CIIU Rev. 3 A.C (adapted for Colombia).

  The CIIU is a classification designed to classify economic activities; "An economic activity can be seen as a production process whereby the enterprise or establishment combines inputs, labor, machinery, equipment and production techniques to obtain a homogenous set of goods and/or services[16].

  In national accounts, productive activities are classified into sixty one (61) industries. They are not grouped in major sections. The classification of activities used in the 2005 base and its correspondence with the CIIU Rev. 3 A.C can be found in Annex 1.

  This classification is also used to classify institutional units, according to their main activity.

- **Classification of Products**. Its purpose is to classify goods, services and knowledge-capturing products; these can be nationally produced for the domestic market, imported or exported. The product classification used in the 2005 base is defined in terms of CPC Ver. 1.0 A.C. CPC classifies products in categories based on physical properties, intrinsic nature of products, as well as according to the principle of the industrial origin.

  The degree of breakdown of the products depends largely on the information available: therefore, products presenting a greater breakdown are products of agriculture, followed by products of the manufacturing industry and of the mining sector. In contrast, services are more aggregated, due to the limited statistical development in certain fields such as those corresponding to division 57 "Market health and social work" or those of division 59 "Other market community, social and personal service activities except sewage and refuse disposal, sanitation and similar activities".

  The product classification of national accounts considers three levels of aggregation: group, subgroup and elemental product.

[16] ISIC Rev. 3 adapted for Colombia, p. 29

- **Group.** It is equivalent to the higher level of the product classification. It is represented by a two-digit code that normally corresponds to the code in which the activities that typically produce those products are grouped, though with certain exceptions.

- **Subgroup.** It is equivalent to the intermediate level of the classification. It is represented by a four-digit code, where the first two digits correspond to that of the group.

- **Elemental product**. It is equivalent to the lowest level of the classification. It is represented by a six-digit code, where the first four digits correspond to the subgroup. It is the highest level of disaggregation of products in national accounts. It is at this level, that the elements of supply and demand are calculated and commodity flow balances are compiled.

The product classification consists of sixty one (61) two-digit groups, seventy-three (73) four-digit subgroups and 369 six-digit elemental products. Annex 2 presents the product classification as defined for the 2005 base and its correspondence with the CPC Ver. 1.0 A.C.

Nevertheless, in the case of the backcasted series (i.e., the estimation of national accounts for years prior to 2005), a simplified classification is used.[17]

- **Relationship between the product and economic activity classifications.** The classifications of products and of industries are generally related, because each activity is characterized, among others, by the set of products that it produces or by the type of services that it provides. The classification of industries is generally more aggregated than that of products, since several products can be obtained from a single productive process.

The relationship between the classification of activities and that of products is mainly a one to one relationship; this means that in general, the products belonging to group *n* (two digits) of products are characteristic products of the activities of group *n* (with the same code) of the classification of activities.

There are, however, some exceptions such as the veterinary services (code 030304) that are included in product group 03, although veterinary activities are grouped with the human health care activities in group 57 of the activity classification; the case of “Hides and skins of bovine, sheep, goat, equine and other animals” (code 100105) within the product group 10, is a characteristic product of activity 03 “Farming of animals and hunting n.e.c.”; the advertising services (code 530201) within the product group 53 can be produced typically by many activities, in particular the press (in activity 26), television, etc..

1.4.2. Classifications of institutional sectors

The institutional sectors correspond to groups of institutional units based on their main economic function. Institutional units are grouped into five sectors; each includes the units

[17] See Annex 3 classification of the backcasted series 2000-2004, National Accounts.

with a similar main economic behavior, thereby responding to a same purpose and their main income come from a similar source.

The resident sectors are divided into subsectors. The classification of institutional sectors, and subsectors and their contents are illustrated in Annex 4 and are defined in Chapter 8.

1.4.3. Classifications of transactions, assets and liabilities.

"Most economic actions are undertaken by mutual agreement between institutional units. They are either an exchange of economic value or a voluntary transfer by one unit to another of a certain amount of economic value without a counterpart. These actions undertaken by mutual agreement between two institutional units are called transactions in the SNA. The SNA also treats certain economic actions involving only a single institutional unit as transactions. They are described as internal, or intra-unit, transactions"[18].

Other flows are changes in value or volume of assets and liabilities that are not the result of transactions. "The reason that these flows are not transactions is linked to their not meeting one or more of the characteristics of transactions. For example, the institutional units may not be acting by mutual agreement, as with an uncompensated seizure of assets. Or the change may be due to a natural event, such as an earthquake, rather than a purely economic phenomenon. Alternatively the value of an asset expressed in foreign currency may change as a result of an exchange rate change"[19]

The SNA defines classifications of transactions, assets and liabilities; they are divided into six major groups, each of them identified by a letter: the first three groups refer to transactions; the fourth to the "other flows" and the last two, assets and liabilities and balancing items.

The letters that identify the groups are:

(P) Transactions in products
(D) Distributive transactions
(F) Transactions in financial assets and liabilities
(K) Non-financial assets
(A) Financial assets and liabilities
In the classification of assets and liabilities a distinction is made between financial assets (AF) and the non-financial produced and non-produced assets (AN).
(B) Balancing items and aggregates of the system

These groups are disaggregated as illustrated below with operations D.1 and D.2:

D.1 Compensation of employees
D.11 Wages and salaries
D.12 Employers' social contributions
D.121 Employers´ actual social contributions
D.122 Employers' imputed social contributions

D.2 Taxes on production and imports
D.21 Taxes on products
D.211 Value Added type taxes (VAT)

[18] SNA 2008 paragraph 2.22
[19] SNA 2008 paragraph 3.99

D.212 Taxes and duties on imports, excluding VAT
D.2121 Import duties
D.2122 Taxes on imports excluding VAT and duties
D.213 Export taxes
D.214 Taxes on product except VAT, import and export taxes
D.29 Other taxes on production

The classification that has been defined for transactions, assets and liabilities for the 2005 base can be seen in Annex 5.

1.5. CLASSES OF ACCOUNTS: Chronological sequence of accounts

The disclosure of national accounts for a given year is done in different points of time, using information with different levels of accuracy ranging from the use of indicators of anticipated character, with limited coverage, up to the use of information with complete and final coverage as that reported in the financial statements of enterprises.

Thus DANE, with the purpose of providing timely information on the latest performance of the economy, disseminates preliminary, provisional and final versions of annual national accounts, based on the increasing accuracy of the statistical instruments used in the measurement.

- **The preliminary version**. It is the timeliest version of the annual accounts. It is derived from the accumulation of the quarterly accounts. The last quarterly accounts are published three months after the end of the calendar year. Two elements differentiate this version: firstly, the scope of the estimate, which is limited (as opposed to provisional and final versions) to the analysis of production excluding the institutional sectors accounts (government, households, etc.), which are more demanding in terms of information. Secondly, this version is characterized by the use of indicators or typical variables strongly linked to the behavior of some of the economic variables such as the slaughter of cattle, the demand for electricity, gas consumption, the traded supply (for the estimation of the value added of trade), the behavior of the stock of vehicles, the subscribers to telephone service, the collection of taxes, the stock of constructions, the demographic behavior, and the entrances to movie theaters, among others.

  However, for this version there is also information with the required timeliness, coverage and quality that inform on the behavior of some activities like that of coal mining, petroleum and gas, the manufacturing industry (despite its greater aggregation), areas of buildings under construction, some public utilities, accommodation services and the financial activity.

- **The provisional version**. The provisional version is disclosed with a time-lag of one year and a half with respect to the end of the calendar year: it is driven by information from statistical research, with less complexity in scope and instruments of data collection than annual surveys and naturally less time-consuming in their processing, which enables a greater availability and timeliness. Some clear examples of this type of information are as follows: the economic monthly samples conducted by DANE, the agricultural forecasts associated with planted areas, the

volume and price indices derived from limited samples of financial statements of representative enterprises of different economic activities.

- **The final version**. The final version is disclosed with a time-lag of two years and a half with respect to the end of the calendar year. It incorporates all the information, as final, generated in the statistical research and administrative records provided not only by DANE but by other sources of information. These require time for their collection, review, consistency analysis, processing and finally their delivery to users. Examples of these statistics are the annual manufacturing, trade and services surveys, the financial statements of financial and non-financial corporations, and the detailed data of balance of payments, among others.

1.6. GENERAL PROCESS FOR THE COMPILATION OF CURRENT YEARS' NATIONAL ACCOUNTS

The purpose of the current years' national accounts is to observe the changes that arise from one period to the next, maintaining the consistency of the time series. It is a less complex operation than the compilation of a base year. In many cases, calculations are based on the changes over time of indicators of value, prices or volume. The process to compile the accounts varies depending on whether it is a preliminary, provisional or final version.

The preliminary accounts are a result of the quarterly accounts of the current year; the value of year n is obtained as an aggregate of the 4 quarters[20]. The methodology used in these accounts is explained in the "Methodology of quarterly national accounts - 2005 base" document.

The provisional accounts are compiled with a similar methodology as that used for final accounts. The differences are primarily in the sources of information used, for example the use of monthly and quarterly samples of manufacturing industry, trade and services, instead of annual surveys used in the final accounts. The present document mainly explains the method used to prepare the final accounts.

The process to compile the final national accounts of current years includes a set of tasks ranging from preparing the basic statistics according to the requirements of the national accounts, to the integration of the results obtained within the accounting framework of analysis.

In a first stage, the sectoral staff processes the basic information and autonomously calculates each of the elements of the system, without integrating their parts. They calculate the elements of supply and of demand for products, the accounts of the industries and the accounts of institutional sectors.

In a second stage, the process of synthesis is carried out which consists of gathering the works done by different sections and making them consistent. This process is performed by steps: after gathering the works from different groups and making them compatible, the representative aggregates of the national economy are compiled and reviewed including GDP, national income, saving, final consumption, and gross capital formation, among others.

[20] DANE. Methodology of quarterly national accounts - 2005 base

The SNA framework provides tools to achieve data consistency. The supply and use table is a vital tool for constructing goods and services accounts along with the integrated economic accounts. These tools ensure the coherence of the different approaches that are carried out throughout the compilation of the accounts and enable the coherence of estimations to be controlled and ensured: for example, the consistency within the production processes between input and output, the structure of final consumption or the logic of some variables that are only known in an approximate manner.

The construction of the final national accounts for current years can be divided into the following processes:

- The goods and services accounts
- The institutional sectors accounts
- The general synthesis of the system

The two first processes are simultaneously developed whereas the general synthesis gathers the results of the previous processes, evaluates their results, estimates the missing elements and starts the various rounds of approximation. The following chapters explain the methodology used in each of the processes for current years.

PART 2 - GOODS AND SERVICES ACCOUNTS

2. COMPILATION OF THE GOODS AND SERVICES ACCOUNTS

The goods and services accounts are compiled following two approaches; on the one hand, commodity flow balances are established for products. On the other hand, production and generation of income accounts are defined for production units; subsequently these two approaches are reconciled into supply and use tables.

2.1. PRODUCTS – COMMODITY FLOW BALANCES

The construction of the commodity flow balances (BOU)[21] consists of recording for each product the origin of supply and the destination of demand, and then consolidating such balances for the whole economy. Supply is made of domestic production (P) and imports (M), and demand includes intermediate consumption (IC), household final consumption expenditure (HFCE), government final consumption expenditure (GFCE), final consumption expenditure of non-profit institutions serving households (NPISHFCE), gross fixed capital formation (GFCF)[22], changes in inventories (ΔI) and exports (X).

Each of the above elements is recorded at its actual exchanged value at the moment of the transaction. Demand of products is recorded at purchasers' prices *(pp).* The purchasers´ price is defined as "the amount payable by the purchaser, excluding any deductible VAT or similar deductible tax, in order to take delivery of a unit of a good or service at the time and place required by the purchaser. The purchasers' price of a good

[21] For its acronym in Spanish
[22] In the 2005 base national accounts, valuables are not treated separately as recommended in SNA. Valuables are included in GFCF when acquired by producers and government, and in final consumption expenditure when acquired by households.

includes any transport charges paid separately by the purchaser to take delivery at the required time and place"[23]. Supply is recorded at basic prices *(bp),* The basic price is defined as "the amount receivable by the producer from the purchaser for a unit of good or service produced as output minus any tax payable and plus any subsidy receivable on the product as a consequence of its production or sale. It excludes any transport charges invoiced separately by the producer."[24] Imports at basic prices corresponds to its value at the importer´s customs frontier (c.i.f. value) plus the import duties which represent the cost of products once they have been admitted to circulate within the national economy.

Since supply is valued at basic prices and demand at purchasers' prices, the net taxes on products and trade and transport margins are added to the value of supply[25], so as to assure the balance between the value of supply and the value of demand. The set of commodity flow balances can be seen on table 1 and is summarized into the following identity:

$$P_{bp} + M_{bp} + \text{taxes on products} - \text{subsidies on products} + \text{trade margins} + \text{transport margins} = IC_{pp} + HFCE_{pp} + GFCE_{pp} + NPISHFCE_{pp} + GFCF_{pp} + \Delta I_{pp} + X_{pp}$$

Table 1. Variables of the Commodity Flow Balances

Uses	Resources
Intermediate consumption IC(pp)	Output P(bp)
Household final consumption expenditure HFCE(pp)	Imports CIF M(bp)
Government final consumption expenditure GFCE (pp)	Taxes and duties on imports excluding VAT
NIPSH final consumption expenditure NPISHFCE (pp)	Other Taxes on products, excluding VAT
Gross fixed capital formation GFCF (pp)	Non-deductible VAT
Δ Inventories Δ I (pp)	Less subsidies on products
Exports FOB X(pp)	Trade margins
	Transport margins

Source: DANE, DSCN
pp = purchasers' prices
bp = basic prices

The goods and services accounts are compiled for the 369 products defined in the national accounts product classification[26].

2.2 PRODUCTION UNITS - PRODUCTION AND GENERATION OF INCOME ACCOUNTS

Production is analyzed following the production approach (establishment unit). Production and related costs such as input, labor inputs and taxes on production are compiled in order to calculate the production account and the generation of income account.

[23] SNA 1993 paragraph. 3.83.
[24] SNA 1993 paragraph. 3.82
[25] Less subsidies on products
[26] See Annex 2: Classification of products of the Colombian annual national accounts.

2.2.1. The production account

"The production account is the starting point for the sequence of accounts for institutional units and sectors displaying how income is generated, distributed and used throughout the economy. Activities defined as production therefore determine the extent of GDP and the level of income for the economy[27]".

The production account shows the result of production (output) and the use of goods and services when producing this output (intermediate consumption). Value added is the balancing item of the production account. (Table 2)

Value added represents the additional value created by a process of production. Value added is obtained as the value of output less the value of intermediate consumption. This balancing item can be measured either gross or net, that is, before or after deducting consumption of fixed capital.[28] This balancing item is usually positive, but there are exceptional circumstances in which it might be negative.

Table 2. The production account

Uses	Resources
P.2 Intermediate consumption	P.11 Market output
B.1 Gross value added	P.12 Output for own final use
K.1 Consumption of fixed capital	P.13 Other non-market output
B.1 Net value added	

Source: DANE, DSCN.

The production is broken down into market output, output for own final use of the producer and other non-market output.

2.2.2. The generation of income account

The generation of income account shows how the value added is allocated among the different factors of production, labor and capital, once the taxes on production have been accounted for. The balancing item of this account is called operating surplus or mixed income, and it measures the surplus or the deficit generated in the production process (Table 3). This item is not equal to the accounting profit (or loss), since only the intermediate consumption of goods and services and compensation of employees are considered within expenditure, excluding for example most of the financial costs (interests), the transfers of expenditures from one period to another, the payments of income tax, etc.

Within value added, compensation of employees corresponds to households, taxes less subsidies to government and operating surplus or mixed income to the owners of the business. In the case of enterprises set up as corporations, the corresponding item is operating surplus and for quasi-corporations, that is, unincorporated enterprises owned by households it is mixed income, since the element of compensation of the labor carried out

[27] SNA 2008, paragraph. 6.1

[28] In Colombia, the balancing items are measured in gross terms. Consumption of fixed capital has only been calculated so far for general government in order to correctly assess the value of its output as the sum of all its production costs (see Chapter 10).

by the owner(s) or other family members[29] cannot be distinguished from the income that corresponds to the owner or owners of the capital and therefore both items are grouped under a unique heading.

Table 3. The generation of income account

Uses	Resources
D.1 Compensation of employees	
D.2 Taxes on production and imports	
Less D.3 Subsidies	B.1 Gross value added
B.2 Gross Operating Surplus	
B.3 Mixed Income	

Source: DANE, DSCN.

2.2.3. Accounts of industries

The production and generation of income accounts are constructed for industries and institutional sectors[30]. For industries the observation unit is the establishment, which is considered the most suitable unit for the analysis of production and its costs.

An establishment is defined "as an enterprise, or part of an enterprise, that is situated in a single location and in which only a single (non-ancillary) productive activity is carried out or in which the principal productive activity accounts for most of the value added."[31]

Establishments are grouped in economic activities (or industries). An economic activity (or industry) is defined as a group of establishments engaged in the same, or similar, kinds of activities. Thus for example, the group of establishments engaged in the manufacturing of wearing apparel constitutes the industry called "Manufacture of knitted and crocheted apparel".

The definition of the industries depends on the classification of productive activities used; as it was previously explained, sixty-one (61) economic activities were defined for the 2005 base.[32]

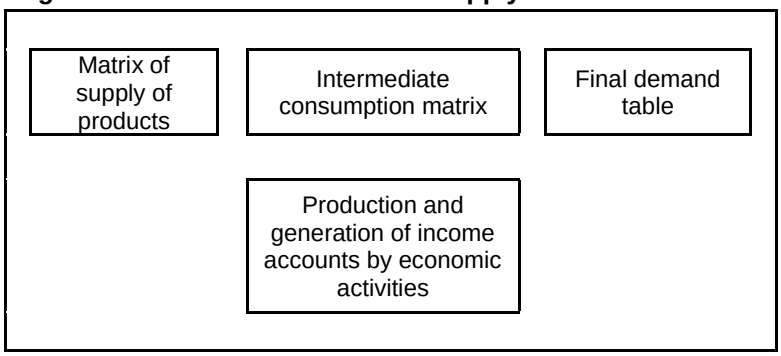
2.3 THE SUPPLY AND USE TABLE

The supply and use table incorporates within a unique accounting table the goods and services accounts by products (the commodity-flow balances), and the production and generation of income accounts of industries. Since the supply and use table presents all the transactions in goods and services within a unique analytical framework, it enables describing the productive process both from the perspective of the supply and of the demand of products, thus integrating the accounts of the industries and the interrelations between industries and products. In addition, it makes it possible to present GDP simultaneously from the production approach, from the expenditure approach and from the income approach.

[29] Unpaid family members provide unpaid labor, similar to that provided by employees.
[30] Chapters 8 and 9 present the accounts by institutional sectors.
[31] SNA 1993 paragraph. 5.21.
[32] Annex 1 presents the classification of industries of the colombian National Accounts.

The supply and use table consists of four tables: the matrix of supply of products, the matrix of intermediate consumption, the final demand table, and the production and generation of income accounts. (Figure1)

Figure1. General structure of the supply and use table

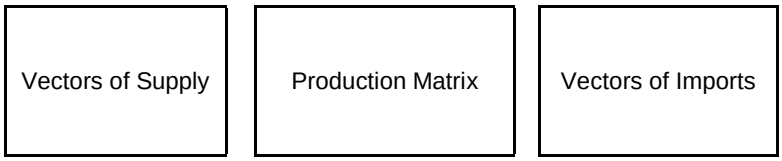


Source: DANE, DSCN.

2.3.1. The matrix of supply of products

The matrix of supply of products presents the supply of goods and services according to their origin, national and imported, broken down into products. It is made of: Vectors of supply, Production matrix and Vectors of imports. (Figure 2)

Figure 2. Elements of the supply of products matrix



Source: DANE, DSCN.

- **Vectors of Supply** The vectors of supply present the total supply at basic prices and at purchasers' prices by products and the elements that enable the transition from a valuation system to another, as follows:

Total supply at purchasers' prices = Total supply at basic prices + trade margins + transport margins + taxes and duties on imports excluding VAT+ Non-deductible VAT + other taxes on products except non-deductible VAT - subsidies on products.

Each element of the identity corresponds to a vector.

- **Production Matrix**. The production matrix presents production broken down by product and by industry. It records in columns, the total production of each industry broken down by products, and in rows, the total production of any given product according to the industries that produce it. Generally, except for the cases mentioned in Section 1.4.1, (relationship between the classification of products and the classification of industries), as a result of the classifications adopted in National Accounts, the diagonal concentrates most production of industries (due to the existing relation between the coding of products and that of industries) whereas the

secondary productions appear outside this diagonal. The total production by products is equal to the total production by industries.

Considering for example a matrix of four products and four industries (Table 4), the output of industry A, Agriculture (column 1), 13.430 thousand million pesos in total, is broken down into 13.000 corresponding to agricultural products, 350 to mining products, 50 to industrial products and 30 to services. Considering row A of agricultural products, total production is 13.120 thousand million pesos, of which 13.000 are produced by the agricultural industry and 120 by the service producing industry.

Although in an economy, the total output by product is equal to the total output by industries, as each industry has both primary and secondary products, the production of products in a category identified with a given code is different from the total production of the industry identified with the same code. In the example, the output of the agricultural industry (code A of industry) is 13.430 and the production of agricultural products (code A of products) equals 13.120 thousand million pesos respectively.

In the lower part of the production matrix, output is broken down into market output and non-market output, which also breaks down into output for own final use and non-market output.

A fundamental distinction is drawn in the SNA between market output and non-market output because of the way each of them is valued. "Market output is the normal situation in a market economy where producers make decisions about what to produce and how much to produce, in response to expected levels of demand and expected costs of supply. The determining factor behind production decisions is that economically significant prices prevail**.** Economically significant prices are prices that have a significant effect on the amounts that producers are willing to supply and on the amounts purchasers wish to buy"[33].

"Output for own final use consists of products retained by the producer for his own use as final consumption or capital formation"[34] A farmer can use part of his production (for example, potatoes) to feed his family (own consumption). Also, part of the construction of dwellings can be done by the final user as own account construction (own capital formation). These two are recorded as output for own final use.

"The other type of non-market output is the output undertaken by general government and NPISHs that takes place in the absence of economically significant prices. A price is said to be not economically significant when it has little or no influence on how much the producer is prepared to supply and is expected to have only a marginal influence on the quantities demanded. It is a price that is not quantitatively significant from the point of view of either supply or demand".[35]

[33] SNA 2008 paragraph. 6.95
[34] SNA 2008 paragraph. 6.114
[35] SNA 2008 paragraph. 6.96

The production matrix is published at the level of sixty-one groups of products[36] and sixty-one industries though it is compiled at a more detailed level of detail of products (369 products).

Table 4. Production Matrix year *n*

Thousand million pesos

	Total production of product	Economic activities			
		A Agriculture	B Mining	C Manufacturing	D Service activities
A. Agricultural products	13.120	13.000	0	0	120
B. Mining products	16.350	350	16.000	0	0
C. Manufacturing products	9.250	50	150	9.000	50
D. Services	9.785	30	55	1.200	8.500
Total output of economic activities	**48.505**	**13.430**	**16.205**	**10.200**	**8.670**
Market output	46.124	13.380	16.204	10.170	6.370
Non-market output	2.381	50	1	30	2.300
Output for own final use	81	50	1	30	0
Other non-market output	2.300	0	0	0	2.300

Source: DANE, DSCN.

- **Vectors of Imports**. Vectors of imports present the imports of goods and services broken down by products. Since total imports are valued FOB (port of departure) to be in agreement with the valuation used in Balance of Payment, while at the level of each of the goods, the valuation in national accounts is CIF (Colombian port), it is necessary, on the one hand, to separate the goods and the services in two different columns and, additionally to include a column and a row corresponding to the CIF-FOB adjustment, whereby the differences between the FOB and the CIF values of the foreign trade in merchandise can be handled as follows: in the intersection between the row of CIF- FOB adjustment and the column of imports, the total value of freight and insurance on imports rendered by resident and non-resident producers is shown with a negative sign, as their values are included in the CIF valuation of the goods; in the same row, the same value appears with a positive sign (so that the general total of the row is zero) that is assigned to transport and insurance (with an opposite sign, so that the total of the column is also zero). In so doing, the transport and insurance services on imports rendered by non-residents are recorded as imports of the corresponding services, whereas the transport services and insurance on imports rendered by residents are considered as exports (negative imports) of the corresponding services[37]. This is shown in Table 5:

[36] There is information available at the level of 369 products.
[37] Section 5.3.5 explains how to perform the CIF–FOB adjustment on imports.

Table 5. Elements of imports year 2008

Thousand million pesos

Code	Description	CIF/FOB Adjustment on imports	Imports	
			Goods	Services
2	Other agricultural products		4.467	
3	Live animals, animal products and products from hunting		55	
4	Forestry and logging products		111	
5	Fishing products, fish farming and related services		12	
6	Mineral Coal		4	
7	Crude petroleum, natural gas and uranium and thorium minerals		487	
8	Metallic minerals		78	
9	Non-metallic minerals		260	
10.-36	Manufactured Goods n.e.c.		80.618	
37	Wastes or scraps		241	
38	Electrical energy, gas and water			4
45	Accommodation food and beverage services			23
46	Land transport services	-225		71
47	Water transport services	-3.685		3.743
48	Air transport services	-776		1.594
49	Supporting transport services			209
50	Postal and courier services			411
51	Financial and related services	-186		2.940
52	Real estate services			
53	Business services except financial and real estate services			3.097
59	Services of membership organizations, cultural, sports and other market services			148
	Adjustments			
	CIF/FOB Adjustment on Imports	4.872	-4.872	0
	Direct purchases abroad by residents		1.369	2.208
	Total	**0**	**82.830**	**14.448**

Source: DANE, DSCN. Matrix supply of products year 2008.

2.3.2. The matrix of intermediate consumption

Intermediate Consumption (IC) can be viewed as a matrix that contains the IC of the different industries broken down by products in the columns and the IC of the products broken down into the industries that consume them in rows. This matrix is of a “products x industries” type. It differs from the Leontieff-type matrices, that are structured as “industries x industries” or “products x products” and which represent either inter-industrial purchases (matrix: industries x industries) or the required inputs for the production of products (matrix: products x products). These matrices of intermediate consumption are constructed on the basis of observations whereas the Leontieff-type matrices must be compiled on the basis of assumptions.

As an illustration, a simple matrix is shown in Table 6. In this matrix, industry A, Agriculture (first column) has a total intermediate consumption of 7.150 thousand million pesos broken down as follows: 100 corresponding to agricultural products, 50 to mining products, 5.500 to manufacturing products and 1.500 to services. Each row of the matrix shows the consumption of a product, according to the industries that use it as IC; thus, the total IC of agricultural products in the economy is 2.700 thousand million pesos (first row), corresponding to: 100 by the agriculture activity, 2.500 by the manufacturing activity and 100 by the services producing activity.

Table 6. Intermediate Consumption Matrix

Thousand million pesos

Economic activities/industries	Total intermediate consumption of product	Industries			
		A	B	C	D
Total intermediate consumption of industry	**20.910**	**7.150**	**4.950**	**7.200**	**1.610**
A. Agricultural products	2.700	100	0	2.500	100
B. Mining products	2.060	50	150	1.800	60
C. Manufacturing products	10.200	5.500	2.500	1.500	700
D. Services	5.950	1.500	2.300	1.400	750

Source: DANE, DSCN.

2.3.3. Final demand

It presents for each product the part used as final demand: the columns correspond to each of the final uses: exports of goods and services, final consumption expenditure and gross capital formation (Figure 3).

Figure 3 Final Demand, by products of national accounts

National accounts Products	Exports		Final Consumption Expenditure					Gross Capital Formation		
	Goods	Services	Total final consumption	Households	NPISH	Government		Total FBK	GFCF	Changes in inventories
						Total government	Collective	Individual			
1										
2										
3										
n										

Source: DANE, DSCN.

2.3.4. Production and generation of income accounts by industries

In the lower part of the use table, the production and generation of income accounts is presented for each industry (Figure 4).

Figure 4. Production and generation of income accounts

Concepts	Total industries	Industries			
		1	2	…	61
Total intermediate consumption					
Total production					
Value Added					
Compensation of Employees					
Other taxes on production					
Other subsidies on production					
Mixed Income					
Gross Operating Surplus					

Source: DANE, DSCN.

2.4 GROSS DOMESTIC PRODUCT (GDP)

GDP represents the final result of the productive activity by all production units resident in the economy. It is an aggregate that characterizes the economy as a whole. It is measured from the different approaches such as production, expenditure and primary income generated by the resident production units.

GDP according to the production approach. GDP is the sum of GVA of resident producers, plus taxes less subsidies on products. The total taxes on products (less subsidies on products) are added since production is valued at basic prices.

GDP =∑ GVA industries at basic prices +∑ Taxes and duties on imports excluding VAT + ∑ Non-deductible VAT + ∑ other taxes on products (except duties on imports and Non-deductible VAT) - ∑ subsidies on products.

The gross value added of an industry at basic prices is equal to the value of production at basic prices minus the value of intermediate consumption at purchasers' prices.

GVA =P-IC[38]

GDP according to the expenditure approach. GDP is equal to the sum in the economy of total final uses of goods and services measured at purchasers' prices, less total imports of goods and services.

GDP at market prices =∑ final consumption pp + ∑ gross fixed capital formation pp + ∑ Changes in inventories pp + ∑ Exports pp - ∑ Imports

GDP according to the income approach. GDP is the sum of primary income generated by resident production units.

[38] Intermediate consumption is valued at purchasers' prices

$$GDP = \sum CE + \sum IP + \sum GOS + \sum MI$$

Where:
CE = Compensation of employees
IP = Taxes on production and imports
GOS = Gross operating surplus
MI = Mixed Income

Taxes on production and imports are equal to taxes on products less subsidies on product plus other taxes on production less other subsidies on production.

3. MEASURES OF PRICES AND VOLUME

National accounts are initially compiled at current prices, in order to identify the changes in value of the variables year after year. However, there is a specific interest in breaking down these changes into those due to prices and those in which the effect of changes in prices is excluded and that might be described as “real”.

In the past, the effect of changes in the prices of goods and services was excluded by compiling the accounts of current years using the current prices of the base year, a method internationally recommended until 1993. However, it caused significant distortions; first of all because current prices are the only ones to balance supply and demand and second due to the complexity of introducing new products under this method.

Since the 2005 base, Colombia has adopted a different method called “chaining”, that has been internationally recommended since SNA 1993, which enables obviating some of these inconveniences, though unfortunately, introducing others that seem overall less serious.

Calculations at constant prices are performed for goods and services transactions, which value can be broken down into a price and a quantity component (volume). It is applied to the components of GDP calculated from the production and the expenditure approaches, but not for the rest of accounts and operations of the system where it is not possible to identify any price or volume, such as the components of GDP following the income approach, the operations of distribution and allocation of income (compensation of employees, taxes, property income, transfers, social benefits) and generally, the accounts of institutional sectors. For these accounts calculations are only performed at current prices.

3.1. METHODS USED FOR CALCULATIONS AT CONSTANT PRICES (ALSO DESCRIBED AS IN VOLUME TERMS)

When the changes of economic variables are observed over time, mainly those related to GDP: production, intermediate consumption, exports, imports, household final consumption expenditure, value added, the question that immediately arises is how much of the observed change is caused by an actual growth in volume (physical amounts, relative weight of segmented markets, qualities, etc.) and how much is caused by the change in relative prices. That is, analysts need to be able to isolate, within the observed

increase in value, how much is attributable to the growth in prices and how much to the growth in volume: a growth that would then be qualified as "real".

Unfortunately, there is no unique method to make this distinction; each method provides different results and each has its drawbacks and benefits.

One of the most intuitive methods is to express the values of every year using the prices of a single year, those of the first year of the series or any other year. Using this method, calculations at constant prices are established: all variables associated with goods and services of the national accounts for every observed year are calculated in a unique system of prices so that it is possible to compare data year after year without interference of prices, since the same prices are used for every year.

Such calculations that have been used widely but with some drawbacks not only in Colombia but throughout the world are called "at constant prices"; they have gradually led to recommend other methods to isolate the effect of changes in prices. These drawbacks are:

The change of values over time of aggregates calculated at constant prices following this procedure depends on the year of reference:

- At prices of a year other from those of the current year, the value of supply is not equal to the value of demand: the commodity flow balances are "forced" into balance which in the long run generates distortions on the less robust variables, in particular, changes in inventories, distortions that increase as the current year moves away from the reference year;

- Finally, products that did not exist in the year of reference cannot be integrated easily within calculations at prices of a fixed year, since the amounts of period 0 are null, and the prices of period 0 do not exist.

This situation naturally has worried national accountants, leading to debates and recommendations, which have evolved gradually from the first proposals in 1968 (SNA 1968), until reaching a certain consensus (SNA 1993 and SNA 2008).

The most recent international recommendations advise the use of indices called "chained" that are obtained by successive multiplication of indices in which each link of the multiplicative chain is a previous year's constant price index. These indices can have different forms; Laspeyres, Paasche, Fisher, etc. They have the advantage that their results do not depend on the year chosen as a reference and that they enable the incorporation of new products in the year to year calculations.

3.2 METHOD USED IN THE 2005 BASE

For the Colombia 2005 base National Accounts, the method that had been used in the past was replaced by the method recommended by the international community.[39] The principle of chaining annual calculations of volume indexes and prices was adopted in

[39] See: United Nations et. al. SCN 1993, Chapter 16, SCN 2008. Chapter 15; and Eurostat. (2001)

order to establish the accounts at constant prices, that is, that for each aggregate,[40] the volume index for year *n* in relation to the base year will be strictly the consecutive product of their annual indices of variation.

This method has the advantage of allowing a permanent update of the system of weights and, therefore, the introduction of products or new structures within the comparisons. Additionally, when changing the base year (a situation that will occur in the future), growth rates between two years will not change mechanically but only when introducing new information, since the base year is no longer involved in their comparison, as was the case before.

However, the drawback in using this kind of index is that it does not have the property of additivity. This means that when applying this index to an aggregate of variables, the value in volume terms of this aggregate is not the sum of its components in volume terms: a difference appears called "statistical discrepancy" that is not an error but results from the lack of additivity of the formula used: usually, this discrepancy is small.

The "statistical discrepancy" for each variable is equal to the difference between the value of this variable obtained directly by chaining its 2005 value and the sum of the values at 2005 constant prices of its components, also obtained by chaining. This is illustrated in Table 7 in which GDP is presented according to the production approach, for the 2000-2008 period at 2005 constant prices by chaining and the statistical discrepancy resulting from this calculation.

Table 7.Gross Domestic Product (GDP) (production approach)
Values at 2005 constant prices, by chaining
2000-2009p

Thousand million pesos

National accounts classification	Concepts	2000	2001	2002	2003	2004
B.1*	Total GDP	284.761	289.539	296.789	308.418	324.866
	Statistical discrepancy	*18*	*-40*	*31*	*-11*	*2*
P.1	Output	491.651	499.763	513.510	533.781	562.969
P.11	Market output	431.807	439.039	452.247	471.369	497.136
P.12	Output for own final use	20.007	20.541	21.640	22.443	23.428
P.13	Other non-market output	39.842	40.166	39.590	39.963	42.403
	Statistical discrepancy	*-5*	*17*	*33*	*6*	*2*
P.2	Intermediate consumption (-)	230.860	234.925	241.670	251.631	265.628
B.1	Value added	260.753	264.816	271.831	282.152	297.341
	Statistical discrepancy	*-38*	*-22*	*-9*	*2*	*0*
D.21-D.31	Taxes less subsidies on products	23.990	24.763	24.927	26.277	27.523
D.21	Taxes on product	24.428	25.206	25.381	26.745	28.045
D.211	Non-deductible Value Added Tax (VAT)	15.144	15.284	15.335	16.309	17.125
D.212	Taxes and duties on imports, except VAT	1.778	2.000	2.080	2.251	2.545

[40] The change in inventories is the only exception, as it corresponds to the difference between two levels and, consequently, it requires a special treatment.

D.213, D.214	Other taxes on product	7.745	8.040	8.043	8.235	8.372
	Statistical discrepancy	*-239*	*-118*	*-77*	*-50*	*3*
D.31	Subsidies on products (-)	447	455	462	478	520
	Statistical discrepancy	*9*	*12*	*8*	*10*	*-2*

National accounts classification	Concepts	2005	2006	2007	2008	2009p
B.1*	Total gross domestic product	340.156	362.938	387.983	401.744	407.577
	Statistical discrepancy	*0*	*0*	*20*	*15*	*148*
P.1	Output	589.688	629.788	670.748	694.992	698.826
P.11	Market output	520.834	557.965	595.422	617.192	618.905
P.12	Output for own final use	24.166	25.218	25.955	26.729	27.081
P.13	Other non-market output	44.688	46.605	49.356	51.055	52.838
	Statistical discrepancy	*0*	*0*	*15*	*16*	*2*
P.2	Intermediate consumption (-)	278.407	298.900	318.547	330.571	327.460
B.1	Value added	311.281	330.888	352.201	364.432	371.283
	Statistical discrepancy	*0*	*0*	*0*	*11*	*-83*
D.21-D.31	Taxes less subsidies on products	28.875	32.050	35.762	37.297	36.146
D.21	Taxes on product	29.415	32.610	36.355	37.906	36.765
D.211	Non-deductible Value Added Tax (VAT)	17.857	19.960	22.412	23.311	22.686
D.212	Taxes and duties on imports, except VAT	2.949	3.607	4.292	4.723	4.194
D.213, D.214	Other taxes on product	8.609	9.043	9.645	9.888	9.836
	Statistical discrepancy	*0*	*0*	*6*	*-16*	*49*
D.31	Subsidies on products (-)	540	560	581	594	606
	Statistical discrepancy	*0*	*0*	*-12*	*-15*	*-13*

Source: DANE, DSCN.

* Depending on the case, B.1 might represent either value added (VA) or GDP

3.3. INDICES USED

In Colombia, following the EUROSTAT´s recommendations[41], it was decided to use chained Laspeyres volume indexes, that is, indices constructed in such a way that for each of the variables of the commodity flow balances, each link (in which each year *n is compared* with the immediately previous year *n-1*) is a Laspeyres index; additionally, at previous year's prices, the commodity flows are balanced (meaning that supply and demand are forced to be equal, using prices of the previous year; a minimum adjustment in periods of low inflation).

This means that not only the prices of the current year are those that balance supply and demand, but additionally, that such a property is extended (by adjustment) to the current prices of the previous year.

[41] SNA 1993 and 2008, recommend using chain indices but without specifying any formula to be applied; Eurostat recommends the use of chained Laspeyres indices, in which the accounts at previous year's prices are balanced.

In this system, the volume indexes relating two consecutive periods have the following expression:

$$I_{Vol^{n/n-1}} = \frac{\sum p^{(n-1)} q^{n}}{\sum p^{(n-1)} q^{(n-1)}}$$

And the volume indices relating two non-consecutive periods n and m:

$$I_{Vol^{n/m}} = \frac{\sum p^{(n-1)} q^{n}}{\sum p^{(n-1)} q^{(n-1)}} \times \frac{\sum p^{(n-2)} q^{(n-1)}}{\sum p^{(n-2)} q^{(n-2)}} \times \ldots \times \frac{\sum p^{(m)} q^{(m+1)}}{p^{(m)} q^{(m)}}$$

It should be noted that the chained volume indices are not additive, meaning that the extrapolation of an aggregate using a volume index of this type is not the sum of the extrapolated values of its components.

An additional innovation on this current version is that, except for the accounts at previous year's prices (as mentioned before, for these accounts, the value of supply and demand are balanced), data at constant prices by chaining are not adjusted; for any aggregate, a statistical discrepancy is generated as the difference between the extrapolated value of this aggregate and the sum of its extrapolated components. The purpose behind leaving these statistical discrepancies is to try to preserve, to the extent possible, the volume index for each aggregate as it results from the direct calculation. For those users who need the property of additivity to be fulfilled, for example, when setting models "in volume terms" it is the user who will decide how to analyze the discrepancy and the item that will be adjusted.

While statistical discrepancies are usually quite small (less than 1%), they tend to become bigger as the reference year is further away. However, there may be situations in which certain aggregates group variables with very different behaviors, in which case, the discrepancies can take more significant values: an example of this would be the construction aggregate which combines two variables, construction of buildings and civil construction, which evolve very differently overtime.

Although the lack of additivity requires modifying how the results should be presented, there still remains additivity of variables when it comes to two consecutive years, enabling, for example, to establish the share of each economic activities in the annual growth of GDP, a share that is proportional to the relative importance of its value added in the total value of previous year´s GDP at current prices.

Finally, it is important to note that using this kind of indicator has an important advantage that will be valued in the long term when rebasing takes place: a change in the year of reference, for instance, moving from 2005 to 2010, both calculated by chaining, will not bring any modification of the inter-annual growth rates, which was a disadvantage of the previous formula.

Consequently, and to remind users that the accounts still called "at constant prices" are not derived by directly applying the reference period prices; from this point forward, they will be referred to as "at 2005 constant prices by chaining" (or better yet, as recommended by the SNA 2008 "in volume"). To each of the aggregates also presented with their

components, there is an associated statistical discrepancy, which is proper for each of the proposed breakdowns.

3.4 APPLYING THE CHAINED LASPEYRES VOLUME INDICES IN NATIONAL ACCOUNTS

The goods and services accounts of the National Accounts are constructed initially at current prices and at prices of the immediately preceding year and these accounts are balanced[42]. From these data, growth rates of any year in relation to the immediately preceding one for each of the variables and aggregates of the system are deduced. The index with respect to the base year is compiled by multiplying successively the annual growth indices of each variable or aggregate; and by then multiplying the value in the base year by the corresponding indices in relation to the base year, the values at the base year's prices by chaining are obtained[43].

This means that year-to-year (by comparing n to n-1) Laspeyres volume indices are calculated, in which the relative volume indexes are weighted by the current values of year *n-1*. In the following year, when comparing year *n* with the year *n+1*, the relative volume indexes (*n+1* compared to *n)* are weighted, using the values of year *n* as weights, etc., that is to say, when comparing the value that takes one variable in year *n* in relation to its value in year *m*, a chain of Laspeyres indices is constructed in which two consecutive years are compared by means of a Laspeyres index which base is the immediately preceding year.

Mathematically, this means:

$$I^{Lenc}{}_{vol}\,(n/0) = ((\sum p^{n-1}q^{n})/(\sum p^{n-1}q^{n-1}))x((\sum p^{n-2}q^{n-1})/\sum p^{n-2}q^{n-2}))x\ldots x((\sum p^{0}q^{1})/(\sum p^{0}q^{0}))$$

Each of the factors $((\sum p^{m-1}q^{m})/(\sum p^{m-1}q^{m-1}))$ is a Laspeyres index whose base is the previous year and is called "the link" of the chain.

3.5. HOW TO CALCULATE THE TOTAL VOLUME INDEX FOR PERIOD 2 IN RELATION TO PERIOD 0

Table 8 illustrates the differences in calculations and results of fixed base Laspeyres volume indices (fixed base year 0=100) and chained indices of a total T, sum of two products A and B, whose prices and amounts are known for periods 0, 1 and 2.

The different values are calculated using the corresponding prices and quantities: $V^0(T)$, $V^1(T)$, $V^2(T)$ represent the values of the variable T using prices and quantities of periods 0, 1 and 2 respectively.

The variables $V^{1/0}(T)$, $V^{2/0}(T)$ and $V^{2/1}(T)$ represent the values of the variable T using the quantities of the period identified in the first position (in these cases, period 1, then 2 and then 2) and the prices of the period identified in second position (period 0, 0 and 1 respectively).

These data are used to calculate the Laspeyres volume indices of the variable T for each period as follows:

[42] Balances with an implicit adjustment.
[43] As will be seen in Section 5.5, this method is not applied to changes in inventories.

$I^L_q\ (T)^{(1/0)} = V^{1/0}\ (t)/V^0\ (T)$

$I^L_q\ (T)^{(2/0)} = V^{2/0}\ (T)/V^0\ (T)$

$I^L_q\ (T)^{(2/1)} = V^{2/1}\ (t)/V^1\ (t)$

$I^L_q(T)^{(2/0)\ (chained)} = I^L_q\ (T)^{(1/0)} \times I^L_q\ (T)^{(2/1)}$

The estimated value of aggregate T by chaining is calculated as: $V^0(T) \times I^L_q(T)^{(2/0)\ (chained)}$, which is equivalent to apply to $V^{1/0}(T)$ (quantities corresponding to year 1 and prices of base year 0) the Laspeyres volume index of period 2 in relation to period 1, that is to say, to multiply $V^{1/0}(T) = 84.200$ by 118,3/100 (the Laspeyres volume index of year 2 in relation to year 1).

The difference of this value (99.626) with 75.000+24.500 (T calculated as the sum of its components) is the statistical discrepancy (126). As it can be observed, this value is small.

Table 8. Calculation of volume indices, using different methods

Thousand million pesos

	q_0	p_0	$Val_0=p_0q_0$	q_1	p_1	$Val_1=p_1q_1$	q_2	p_2	$Val_2=p_2q_2$	
A	1000	50	50.000	1250	60	75.000	1.500	75	112.500	
B	300	70	21.000	310	75	23.250	350	80	28.000	
T			71.000			98.250			140.500	
			$Val_{1/0}= p_0q_1$			$Val_{2/0}=p_0q_2$			$Val_{2/1}=p_1q_2$	$Val_{2/0}$ by chaining
A			62.500			75.000			90.000	75.000
B			21.700			24.500			26.250	24.500
T			84.200			99.500			116.250	99.626
Statistical discrepancy										*126*
Laspeyres Volume Indices fixed base 0=100						118,6			140,1	
Laspeyres Volume Indices previous year = 100						118,6			118,3	
Laspeyres Volume Indices by chaining base year 0=100						118,6			140,3	

Source: DANE, DSCN

4. MEASURING TRANSACTIONS AND COMPILING THE SERIES OF GOODS AND SERVICES ACCOUNTS

4.1 The goods and services transactions measured through their evolution

The goods and services transactions for year *n are* measured based on the previous year's (*n-1*) calculation. This entails that the values of the variables for year n are obtained from their value in year *n-1* using volume and price indices. As illustrated below (Tables 9 and 10) the production and household final consumption expenditure of the product

"potatoes" for 2008 are estimated from the values estimated for year 2007 and the changes in the volume and prices indices between 2007 and 2008.

Table 9. Measuring the output of the product: "potatoes"
2006-2008

Thousand million pesos

Concepts	2006	2007				2008					
	Value 06/06	Value Index 07/06	Volume Index 07/06	Value 07/06	Price Index 07/06	Value 07/07	Value Index 08/07	Volume Index 08/07	Value 08/07	Price Index. 08/07	Value 08/08
output at basic prices	1.299	91,5	108,2	1.405	84,6	1.189	149,4	98,4	1.170	151,8	1.776

Source: DANE, DSCN

Table 10. Measuring household final consumption expenditure (HFCE), of the product: "potatoes"
2008

Thousand million pesos

Concepts	HFCE Value 07/07	Volume index	HFCE Value 08/07	Price Index	HFCE Value 08/2008
Household Final Consumption Expenditure (HFCE)	1.000	102,0	1.020	105,0	1.071

Source: DANE, DSCN.

The same procedure is used to calculate production, imports and exports, HFCE, intermediate consumption and taxes and subsidies on products of this product.

Combination of value, volume, and price indices

There are different ways to express the changes in prices and volume. In Colombia, the volume indices are Laspeyres-type and price indices are Paasche-type.

$IValue = Iv^{L} \times Ip^{P}$

In practice, because of the relationship between value, Laspeyres and Paasche indices once two of them are known, the value of the third index is implicitly derived:

a) In some transactions as is the case for imports and exports of goods and services or the output of financial services, insurances or output of the government, data in value are available at current prices which makes it possible to establish the value index; a price index is obtained by different methods and the volume index is implicitly deduced by dividing the value index by the price index:

$$I\ volume = \frac{I\ value}{I\ price}$$

b) Once the volume and price indices are known, the value index is calculated by multiplication. This is the method generally used for agricultural, mining

products and some services for which there is information on the quantities produced and on prices, from which volume and price indices are derived.

I value = I volume x I price

c) When the value and volume indices are known, the price index is implicit. This is the method used for trade margins, and taxes and subsidies on products: in fact, in both cases, the volume index is calculated on the basis of the product to which they are attached; the assumption currently used is that the margin rate is constant overtime; in the case of taxes and subsidies on products, the value index is deduced from the taxes reported as income by government and subsidies reported as expenditure by government.

$$I\ price = \frac{I\ value}{I\ volume}$$

4.2. Process for the compilation of goods and services accounts

The starting point of the process for the compilation of the goods and services accounts is the supply and use table. Each year this table is compiled at current and at previous year´s constant prices, at the detailed level of sixty-one (61) activities and three hundred and sixty-nine (369) products, including FISIM[44]. Supply and demand of products are balanced at current prices and at previous year's constant prices, and the corresponding supply and use table is built; GDP is calculated following the production and expenditure approaches at current and previous year's constant prices as well as following the income approach but in that case, only at current prices.

The accounts are balanced at current and at previous year's constant prices, meaning that supply is equal to demand. Value added is obtained as the difference between the value of production and that of intermediate consumption, a calculation that in the case of previous year's constant prices is called double deflation, since production at previous year's constant prices and intermediate consumption at previous year's constant prices are calculated separately.

Once the accounts in both price systems (at current and at previous year's constant prices) are balanced, the implicit volume indices for each variable of the system[45] are calculated and they are automatically chained so as to obtain the aggregates at 2005 constant prices by chaining. For each aggregate, the value thus projected is compared with the sum of its components and the statistical discrepancy is calculated[46].

The process of compilation of the goods and services accounts follows various stages, ranging from the independent calculation of each of the transactions on goods and services until their integration into the various tables and matrices of the system. For all these transactions the estimations are mainly based on the evolution, calculating the value at current and constant prices by chaining from the data estimated for the previous year.

[44] See definition and treatment given to FISIM in National Accounts.
[45] Except the change inventories for which a different method is used, see Section 5.5.
[46] Explanation in Section 3.2

Step-by-step the values of the variables, obtained from different perspectives, are made consistent, as follows:

- The output by products and by economic activities are reconciled, through production matrices;

- The values considered for each of the transactions are transcribed within the supply and use balances; data are analyzed, contradictions are reconciled, reviewing the sources and the assumptions used in the calculation, so as to achieve the identity between the values of supply and of demand of products;

- The values of intermediate consumption (IC) by products derived from intermediate consumption matrices, are reconciled with the IC derived from the commodity flow balance which can lead to a revision of the previously accepted balances;

- Finally, once the accounts of the current year have been compiled at previous year's constant prices, the values of the various variables at 2005 constant prices by chaining are obtained by multiplying the variables at 2005 constant prices by chaining of the previous year by the volume indices of the current year with respect to the previous year.

Stages of the process

In order to compile the goods and services accounts for the current years the following stages are followed:

- Calculation of the elements of supply and use of goods and services.
- Synthesis of the goods and services transactions.
- Chaining of the accounts at 2005 constant prices by chaining.

Chapter five presents the methodology used to calculate each of the elements of supply and demand, Chapter six covers the synthesis of goods and services transactions (elaboration of the commodity flow balance by products, the matrix of production and the matrix of intermediate consumptions) and Chapter seven explains how the chaining of indices is carried out so as to calculate the accounts at 2005 constant prices by chaining.

5. CALCULATION OF THE ELEMENTS OF SUPPLY AND USE OF GOODS AND SERVICES

As previously explained, the first stage in the compilation of the goods and services accounts consists of calculating, independently, each transaction of goods and services at current and at previous year´s constant prices. This means that for each product of the classification, an estimation is made of production, exports (X), imports (M), household final consumption expenditure (HFCE), government final consumption expenditure (GFCE), final consumption expenditure of NPISH's, gross fixed capital formation (GFCF), change in inventories, taxes on products and subsidies, trade and transport margins. Additionally, production is compiled for both products and economic activities, which estimates are subsequently reconciled using the production matrix.

These calculations are made for each of the 369 products defined in the classification of national accounts. For economic activities, the general method described here is only applied for activities in which the information on production is derived from the production units, meaning that this method is not applied to activities whose basic information comes from accounting data (mainly government non-market economic activities and financial activities).[47]

This section explains the method used to calculate production, HFCE, M, X, GFCE and change in inventories. GFCE is explained in Chapter 10 and intermediate consumption is estimated using the intermediate consumption matrix, which is explained in Section 6.3. Taxes on products, subsidies and trade and transport margins are estimated considering the behavior of the elements of demand, the income of government and the output of trade and transport industries. The previous year's (n-1) values are the starting point to estimate each of these variables, values that are forecasted to year *n* using value, volume and/or price indices derived from other sources.

5.1. PRODUCTION

5.1.1 Concept

"Production is an activity, carried out under the responsibility, control and management of an institutional unit that uses inputs of labor, capital, and goods and services to produce outputs of goods and services"[48].

According to this definition, production involves activities in order to produce goods and services that can be provided to other institutional units.

The activities carried out by households in the production of services for own final use are excluded from the production boundary of national accounts, except the services of owner-occupied dwellings and the services produced employing paid domestic staff.

"Within the production boundary of the SNA the following activities are included:

a) The production of all goods or services that are supplied to units other than their producers, or intended to be so supplied, including the production of goods or services used up in the process of producing such goods or services;

b) The own-account production of all goods that are retained by their producers for their own final consumption or gross capital formation;

c) The own-account production of knowledge-capturing products that are retained by their producers for their own final consumption or gross capital formation but excluding (by convention) such products produced by households for their own use;

d) The own-account production of dwelling services by owner occupiers; and

[47] For these activities, the method followed is further developed in Chapters 10 and 11.
[48] SNA 2008 paragraph. 6.2

e) The production of domestic and personal services by employing paid domestic staff"[49].

5.1.2 Calculation of production

Production is usually calculated using detailed information on products. This is the case for agriculture, livestock breeding, forestry, fishing, mining, land transport and construction, in which the information refers mainly to products. In those cases, production is first estimated by products from which production of their corresponding characteristic industry is derived.

In other cases, there is information concerning the production unit, on which base the production of economic activities is calculated. This method is applied when information such as economic surveys, financial information of enterprises and government entities is available or when estimations are carried out based on employment data. This happens for the manufacturing industry, public utilities, trade, financial services, government and business services.

The production derived from the analysis of products or by economic activities and sources is reconciled in the production matrix (see further description in Section 6.1).

5.1.3. Methods for the estimation of production by products

Estimations of production corresponding to economic activities are based on direct information on products, which consist of various kinds of indicators and methods: information on quantities and prices, information on values, estimates from demand, indirect calculations and special methods. In the following sections the cases in which each method is used are explained as well as how the estimation of production is derived.

- **Information on quantities and prices**. For many agricultural and mining products, information is available on quantities and prices as follows: tons and areas in development in the case of plantations; liters of milk; barrels of extracted petroleum; for other products such as education services, the indicators are the number of enrolled students; or in passenger transportation, the number of transported passengers. Regarding prices, there is direct information on prices or on price indices such as producer price indices, consumer price indices, registration fees, rates applied to transportation, etc. From such information, volume indices (VI) and price indices (PI) are compiled in order to calculate production, as seen below:

(P (n-1/n-1))x (VI (n/n-1)) =P (n/n-1)

(P (n/n-1))x (PI (n/n-1)) =P (n/n)

Where:

P = production
VI = Volume Index
PI = Price index

[49] SCN 2008 paragraph 6.27

Production of year n *P(n)*
Production of previous year (n-1) *P(n-1)*

P(n-1/n-1) is the production of the previous year at previous year's prices, P(n/n-1) is the production of year *n* at previous year´s prices and P(n/n) corresponds to the production of year *n* at current prices.

- **Information on value**. For other products, production at current prices is estimated, based on the revenue of enterprises. Production at previous year´s constant prices is obtained by deflating production at current prices using a price index, defined according to the product. This method is used, for instance, to calculate production of air passenger or freight transport.

Production year (n) at current prices /PI = Production year (n/n-1)

- **From demand**. For some products the production indicator derives from demand. In order to generate the indicator the following components are aggregated: intermediate consumption, final consumption expenditure, GFCF, change in inventories, exports minus imports. This methodology is applied for the following products: parchment coffee, green coffee, flowers, fresh export bananas, bovine cattle, ores mainly composed of gold, precious metal ores and concentrates, emeralds, rental services of machinery and construction of civil works, among others.

In the case of civil works, the production is estimated from the expenditure by sectors in contracting works or undertaking them directly, in the following domains: the general government, energy, gas, water, sewerage, telecommunications businesses, extraction of petroleum and other mining activities.

The production of flowers is estimated using exports and household final consumption data.

- **Using a specific method.** The estimation of the production of residential and non-residential buildings (a method that is further described in paragraph 5.1.4), that of the rental of dwellings and that of FISIM[50] are based on methods specific to each of them.

- **Using an indirect approach**. For products for which direct information is lacking, their change with respect to the previous year is based on a variable related to their behavior: this is the case for instance, of petroleum extraction services, rocks and materials used in construction and equipment leasing services for construction with operator, among others.

Annex 6 lists the products for which production is calculated under the production approach; it shows the method and data used. The method to calculate the production of construction and the rentals of dwellings is set forth in the following section.

[50] FISIM is described in Chapter 11

5.1.4. Specific methods used to estimate production

- **Production of buildings**. It includes the building, enlargements, reforms and maintenance of dwellings and of constructions for various non-residential uses, such as industrial, commercial, government services, warehouses, schools, hospitals and hotels.

The general method used for estimating the production of buildings is based on the accrual principle, which consists of recording production as construction advances.

The accrued production is estimated using the results of DANE's Building Census (CEED)[51], which consists in a permanent and direct monitoring of the works under construction by inquiring about the progress of the projects. For other cities which are not covered by this census, a simulation model is used that estimates the main variables needed for the calculation of production. An estimate of the construction of unlicensed dwellings is also included.

The production corresponding to the construction of rural dwellings is determined using an indirect approach, based on information from the censuses of population and housing, population projections and housing licenses. The production is calculated on a quarterly basis and the annual amount is obtained by adding up the quarterly productions.

Different methods are used to estimate production according to the type of building, availability of information and its progress. Table 11 shows the groups of products for which production is calculated, as well as the data used. The methodology used in each group of products is explained further on.

Table 11. Classification by type of building and data sources

Type of building	Data source
Residential and non-residential buildings in the 15 main urban areas[1]	Building Census CEED
Residential and non-residential buildings of other cities	Building Permits
	Urban dwelling stock
Unlicensed residential buildings	Financing of new dwellings
	Rural dwelling stock
Rural residential buildings	Population projections
	Urban and rural dwelling stock
	Behavior of production of residential and non-residential buildings
Enlargements, reforms and maintenance of buildings	Production of residential and non-residential buildings
Rental services of equipment for construction or demolition of buildings or civil engineering works, with operator	

[1] From the I quarter of 2009, the coverage of the quarterly estimation was extended to the 15 areas of the building Census, thus generating a new series for the 2009-2010 period that was statistically linked to the former one.

[51] For its acronym in Spanish

Source: DANE, DSCN.

- **Residential and non-residential buildings in the 15 main urban areas**

This part of construction is based on the results of the CEED that DANE undertakes on a quarterly basis in the fifteen (15) main urban areas, of which twelve are strictly urban (AU)[52] and three also include the corresponding metropolitan areas (AM)[53].

Considering the differences in the duration of the construction projects, a method was developed which enables the calculation of the value of what was actually built (accrued) each quarter, through the combination of the undertaken works, their progress over time and their market price.

The "Building Census" is a research designed by DANE in 1996, on a quarterly basis which is based on the statistical longitudinal panel technique which enables following the performance and trends of the building activity through observation over time using censuses procedures.

The CEED identifies the works being initiated each quarter, which are included into the system through a questionnaire which collects the main characteristics of the building project in terms of area under construction, m^2 current prices, progress of the work (building item and progress status), purposes, and units sold among other characteristic variables.

For subsequent quarters, a monitoring process is carried out using other types of research methods in order to update the main variables, and guarantee the accurate measurement of the changing patterns of the construction process up to its culmination. At the same time, the works on standby are identified until the re-initiation of the constructive process.[54]

The census provides an individual follow-up of each construction projects; in each period, information is collected on the total area of the project, the saleable private area, the common property area, the parking area, the value per m^2 of the saleable and parking areas and the state of advance of the project (according to the corresponding table organized according to the main items of the construction process) and the degree of progress within a specific item, among others. These variables are used in the determination of the area constructed for each project in the corresponding period.

Accrual is achieved by considering the item in which the construction process is to be found, the coefficient of incidence and the progress status within the item.

Six items were defined that correspond to different stages that take place during a construction process: 1. Site preparation, digging and foundations; Item 2. Structure and cover; Item 3. Masonry, plasters and waterproof works; Item 4. Finish Level 1; Item 5. Finish Level 2 and Item 6, Finish Level 3.

[52] Bogotá, Cali, Barranquilla, Pereira, Armenia, Cartagena, Neiva, Ibagué, Villavicencio, Pasto, Popayán and Manizales.
[53] Medellín, Bucaramanga, Cúcuta.
[54] Colombia - Methodology of National Accounts 1994 base Transactions on goods and services. DANE, Bogotá, August 2002, This document explains with an example the methodology used to calculate the production of buildings, pages 258-261.

The coefficients of incidence represent the average percentage share of each item of the process within the total value of a construction project. Table 12 shows the coefficients of incidence for different types of buildings, classified into the following three groups: group 1, single- and multi-family dwellings; group 2, offices, premises, shopping centers, health centers, hospitals, headquarters of institutions and the like; and group 3, industrial facilities and warehouses. In the case of residential buildings, the coefficients to be applied correspond to group 1 and in the case of non-residential buildings those that correspond to groups 2 and 3.

These coefficients indicate for instance that for the constructions contemplated in group 1, the construction item corresponding to site preparation, digging and foundations represent 10% of progress within the total of the project, the structure and cover, 20%; Masonry, plasters and waterproof works, 15%, and finish levels 1, 2 and 3, 45%, 9% and 1%, respectively.

Table 12. Coefficient of incidence (%), by type (purpose) of construction, according to main items

Main Item	Type of construction		
	Group 1	Group 2	Group 3
Total expenditure	**100**	**100**	**100**
Item 1: Site preparation, digging and foundations	10	13	26
Item 2: Structure and cover	20	27	36
Item 3: Masonry, plasters and waterproof works	15	10	8
Item 4: Finish level 1[a]	45	43	24
Item 5: Finish level 2[b]	9	6	5
Item 6: Finish level 3[c]	1	1	1

Source: DANE. Design of the New Housing Construction Cost Index

[a] Finish level 1: wooden or metallic carpentry, floors, wall and ceiling coverings

[b] Finish level 2: painting, installation of equipment and carpets, glasses and mirrors, installation of appliances

[C] Finish level 3: fine details, cleaning

The progress status within each item corresponds to the constructed percentage of the item in which the project finds itself, measured in a scale from 1% to 100%, with 100% meaning that the corresponding construction item under scrutin was completed and the project has entered the following construction item.

Additionally, the relative weight of each subdivision of the construction item was determined, which is used to establish the progress status. The items are broken down according to the following percentages[55]:

Item 1: Site preparation, digging and foundations: 30% and 70%, respectively.

Item 2: Structure and cover: structure in floors, 80% and structures of the cover, 20%.

[55] Basic collection manual, editing and coding. Building Census. April 2002. Page 32-34.

Item 3: Masonry, plasters and waterproof works: 40% and 60%, respectively.

Item 4: Finish level 1: floors, 30%; covering of walls, 20%; plating, 15%; metallic and wood carpentry, 20%, and ceilings, 15%.

Item 5: Finish level 2: installation of appliances and ironworks, 30%; installation of equipment and carpets, 30%; glasses and mirrors, 10% and painting, 30%.

Item 6: Finish level 3: fine details, 70%; cleaning and final arrangements, 30%.

The area accrued in the period is calculated as the difference between the accrued area accumulated up to date and the accrued area accumulated at the end of the previous period.

An example illustrates the method:

The construction of an apartment building of 9.462 m^2 initiated during month 5 of 2008. When counted for the first time (month 7 of the same year), the project was in item 1, with an advance of 50%. According to the coefficients of incidence of the items and its degree of advance, the accrued area during the quarter was estimated as:

Accrued m^2 during quarter II 2008 = (9.462x10%) x 50%= 473 m^2

During the third quarter 2008, (10^{th} month of observation), the project finds itself in item 2, with an advance of 60%.

Accrued m^2 during quarter III 2008 = Accrued m^2 accumulated to date - Accrued m^2 accumulated until end of the previous period

The accumulated accrued area of this period corresponds to 100% of item 1, and an advance of 60% of item 2.

Accrued m^2 III quarter = 9.462 * (10%*100%) + 9.462 * (20%*60%) - 473

= 946 + 1.135 - 473

Accrued m^2 III quarter = 1.608 m^2

At the end, the sum of the accrued areas in each periods of construction must be equal to the total area of the project. Production at current prices is estimated as the product of the accrued area and the m^2 average price of the project. Average price is obtained by dividing the total value of the project by the total constructed areas, which includes the saleable private area, the common property area and the parking area. This average price is updated as the project advances. Production is calculated independently for each project and the results are summed up.

Production value of housing and other constructions in areas covered by the Building Census = Σ (accrued m^2 of the period x market prices)

Production at constant prices is obtained by multiplying the accrued m^2 of the period by the prices of the m^2 in base year 2005[56]. This calculation is carried out per stratum, per city and per type of housing (single- and multi-family dwellings) and the results are added up.

Non-residential buildings, in order to eliminate the volatility in the implicit price index derived from the results of the CEED[57], the production at constant prices is the average between two values as follows: the first value is obtained by multiplying the accrued area in the period by the value per m^2 in the 2005 base year. The calculation is carried out per city and per type of purpose (offices, premises, shopping centers, education centers, hospitals, headquarters of institutions, industrial facilities and warehouses), and then, the results are added. The second value is obtained by deflating the production at current prices by the ICCV[58].

In the non-residential constructions, the production calculated from the production approach is reconciled with the results obtained from the calculation of gross fixed capital formation in non-residential constructions, based on the information of the different institutional sectors with accounting information.

Residential and non-residential buildings in other cities. The production of construction in cities not covered by the buildings census conducted by DANE (it refers to the other urban areas), is estimated through a model that simulates the initiations of the projects, using construction permits data.

The source of information for this group is the area licensed for construction, derived from a research by DANE that covers seventy-seven municipalities of the country. The licensed area is expanded to other urban areas using the results of a study carried out by the Ministry of Economic Development (currently Ministry of Trade, Industry and Tourism), during 1996 and the first half of 1997; this study found that the construction permit research coverage as compared to the corresponding total represented approximately 84% of the total licensed area for dwellings and 92% of the other types of constructions with respect to the national total[59].

The total licensed area is divided into two groups: one that corresponds to the municipalities covered by the census, which has to be excluded and the other corresponding to other urban areas. For the latter, the area built in the quarter is estimated from the licensed m^2, by applying a lag model. According to this model, 76% and 51% of the licensed projects of residential and non-residential constructions respectively are estimated to start in the quarter of approval and the remaining in the next quarter[60].

The area estimated as started in each quarter is accrued overtime, using the typical maturity curves associated with the investment in building.

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[56] It must be observed that in this case, the chaining method is not applied; this will be modified in the revision of the 2005 base to come.

[57] Since it does not only reflect the prices changes but also changes in the composition by purpose, i.e. a "quality" effect.

[58] Acronym in Spanish for Housing Construction Cost Index

[59] Magazine issue. 4. Urban Development figures. February to May 1998. Studies Center of Construction and urban and regional development (CENAC) Vice-ministry of Dwelling, Urban Development and Water Supply.

[60] Average behavior, that results from comparing the licensed area and the accrued m^2 of new projects reported for Barranquilla, Bucaramanga, Armenia and Pereira in the CEED.

The maturity curves represent the average duration of a project and the proportion of the value executed in each period. They are the result of a study of frequencies calculated from the results of the accrued area obtained by the CEED, between 2005 and 2007, for different purposes. The results of the curves are presented in Table 13.

According to the results of the research on maturity curves, the construction of a multi-family dwellings project lasts on average six quarters; the level of progress or execution of the work for the first quarter is estimated to represent 17% of the total, 35% for the second quarter; 25% for the third one; and 23% for the last quarter.

Table 13. Typical Maturity Curves of building

National Total by type of building

Types of construction	Quarters					
	I	II	III	IV	V	VI
Average residential construction	0,14	0,27	0,24	0,22	0,07	0,06
Single-family dwelling	0,17	0,35	0,25	0,23	0	0
Multi-family dwelling	0,12	0,19	0,22	0,2	0,15	0,12
Non-residential construction average	0,24	0,36	0,21	0,14	0,05	0
Offices	0,18	0,37	0,27	0,11	0,05	0
Commercial Premises	0,18	0,49	0,33	0	0	0
Warehouses	0,35	0,35	0,18	0,13	0	0
Education Centers	0,2	0,3	0,16	0,18	0,16	0
Hotels	0,25	0,27	0,19	0,27	0,03	0
Hospitals	0,2	0,37	0,21	0,14	0,08	0
Public Administration	0,36	0,44	0,1	0,1	0	0
Other	0,22	0,3	0,23	0,18	0,07	0

Source: DANE. Maturity Curves

The total accrued areas in each quarter for the group “other urban” is equal to the sum of the accrued area of the different stages of the curve, which refer to the initiation of projects in the current and previous periods. For the valuation of this production, an average market price of dwellings and non-residential buildings is calculated from information on cities of intermediate size covered by the Building Census.

The production at constant prices is calculated by multiplying the area accrued in the period by the average value of the m^2 in the 2005 base year[61].

- **Residential unlicensed buildings in urban areas.** This part corresponds to unlicensed constructions in urban areas. This production is estimated for the departments not covered by the Building Census[62].

[61] See footnote 10.
[62] In areas where the CEED census is applied, it is assumed that this covers the entire building activity

The method is indirect and aims at estimating the number of unlicensed urban dwellings constructed, comparing the stock of existing dwellings in each quarter, and removing from the comparison the dwellings constructed with permit. The data on the stock of dwellings derives from the study conducted for the calculation of the production of rental of dwellings in the 2005 base[63].

First, the number of new dwellings corresponding to the reference quarter is determined at department level, as the difference between the stock of urban dwellings[64] of the current and of the previous period, and excluding the number of new financed dwellings[65] sold. The result obtained corresponds to the number of self-financed dwellings, which are classified into those that are built with and without permit, using the information of the 1993 National Living Conditions Survey[66].

In order to convert units of dwellings into constructed square meters, the average area of dwellings is used, which estimation is based on the size of dwellings corresponding to the socioeconomic stratum 1 and 2 of the intermediate municipalities surveyed by the CEED. The estimated area is accrued overtime, applying the maturity curves and the average price of similar types of dwellings in the current years, or in 2005, when calculating the accounts at constant prices. Table 14 shows the calculations for years 2007 and 2008 at current prices.

Table 14. Production of Unlicensed Residential Buildings at current prices, by years and quarters
2007 - 2008 (I-IV quarters)

Years and quarters	Stock of urban dwellings	New Dwellings	Financed Dwellings	Self-financed dwellings	Unlicensed dwellings	Unlicensed m^2	Price Per m^2	Production (Thousand million pesos)
Total 2007	n.a	44.055	5.772	38.283	9.640	327.760		100
I	1.552.305	13.862	1.349	12.513	3.151	107.134	300.227	27
II	1.559.987	7.682	1.300	6.382	1.607	54.638	304.585	26
III	1.570.690	10.703	1.415	9.288	2.339	79.526	304.981	23
IV	1.582.498	11.808	1.708	10.100	2.543	86.462	307.049	25
Total 2008	n.a	49.855	6.515	43.340	10.913	371.042		114
I	1.594.125	11.627	1.511	10.116	2.547	86.598	316.268	26
II	1.607.508	13.383	1.621	11.762	2.962	100.708	322.735	28
III	1.620.279	12.771	1.615	11.156	2.809	95.506	326.505	30

[63] Cuentas nacionales base 2005. Principales cambios metodológicos y resultados. DANE, Noviembre 2010//National Accounts 2005 base. Methodological changes - Most relevant results. DANE November 2010
[64] Source: Study of the production of rental of dwellings 2005 base, DANE, DSCN.
[65] Source: DANE Research on statistics of the financing of dwellings, which provides information on the number and the value of the financed dwellings, using a long term mortgage provided by the different financial institutions, classified into new and used homes.
[66] In order to determine the number of self-financed homes with and without a license for other urban areas, the 1993 Living Condition Survey was used, finding that 74,8% of the self-financed dwellings are built under license and the remaining 25,2% are unlicensed.

IV	1.632.353	12.074	1.768	10.306	2.595	88.230	324.893	29

Source: DANE, DSCN.

n.a: Not applicable

Residential building in rural areas. The estimation of the production of this type of buildings is calculated as a national total. According to the general method, the estimation of the production starts from the identification of the initiated square meters of rural dwellings (broken down into traditional rural houses and country second homes), level of progress of the projects and the basic current prices, for both rural main- and second-home dwellings.

The change in the stock of rural dwellings is used to calculate production of rural residential buildings, which is obtained from the 2005 population and housing census and a projection of the rural population; the new units are divided into traditional rural and second homes and for each of them the accrued area is calculated applying the maturity curves. In order to estimate production, the area accrued is multiplied by the average m^2 price.

The price is calculated separately for each type of building, for the traditional rural building, the average price per m^2 is estimated as 75% of the price corresponding to socioeconomic strata 1 and 2 of licensed dwellings of the intermediate municipalities; and for second homes, the average value of m^2 is estimated as 75% of the price corresponding to socioeconomic strata 5 and 6. Both prices evolve over time as the Housing Construction Cost Index (ICCV)[67]. Table 15 shows the production at current prices for years 2007 and 2008.

The production at constant prices is the product of the areas accrued of the period and the average price per m^2 in 2005.

Table 15. Rural dwelling production, at current prices, by years and quarters
2007 - 2008 (I-IV quarters)

Years and quarters	StocK of Rural dwellings	Number of new dwellings	Number of traditional rural dwellings	Rural second homes	m^2 Traditional rural Dwellings	m^2 rural second homes	Production (Thousand million pesos)
Total 2007	--	42.801	42.297	504	3.466.405	41.487	1.092
I	2.858.900	10.614	10.489	125	859.787	10.283	267
II	2.869.532	10.632	10.507	125	863.650	10.360	273
III	2.880.300	10.768	10.641	127	868.775	10.394	274
IV	2.891.087	10.787	10.660	127	874.193	10.451	278
Total 2008	--	43.778	43.263	515	3.543.117	42.318	1.184
I	2.901.884	10.797	10.670	127	878.048	10.496	288
II	2.912.698	10.814	10.687	127	881.229	10.538	295

[67] For its Spanish Acronym

III	2.923.773	11.075	10.945	130	888.004	10.593	300
IV	2.934.865	11.092	10.961	131	895.836	10.691	301

Source: DANE, DSCN

--: Not applicable

Total Production. Tables 16 and 17 present the value of production for years 2007 and 2008 at current prices and at 2005 constant prices, for each of the groups making up product 410101 of the classification.

Table 16. Production of residential buildings, at current prices, by years and quarters

2007 - 2008 (I-IV quarters)

Thousand million pesos

Years and quarters	Total residential buildings		Residential buildings in other urban areas	Unlicensed residential buildings	Rural residential buildings
Total 2007	12.607	9.481	1.933	101	1.092
I	3.042	2.307	441	27	267
II	2.995	2.225	471	26	273
III	3.129	2.342	490	23	274
IV	3.441	2.607	531	25	278
Total 2008	16.209	12.437	2.475	113	1.184
I	3.772	2.885	573	26	288
II	3.915	3.010	582	28	295
III	4.722	3.748	644	30	300
IV	3.800	2.794	676	29	301
Share %	100	77	15	1	7
Annual Index change	128,6	131,2	128	111,9	108,4

Source: DANE, DSCN.

Table 17. Production of residential buildings, at 2005 constant prices, by years and quarters

2007-2008 (I-IV quarters)

Thousand million pesos

Years and quarters	Total residential buildings	Residential buildings in the main 15 urban areas	Residential buildings in other urban areas	Unlicensed Residential buildings	Rural residential buildings
Total 2007	10.261	7.657	1.523	90	991
I	2.573	1.941	362	24	246
II	2.501	1.853	378	23	247
III	2.510	1.860	381	21	248

IV		2.677	2.003	402	22	250
Total 2008		11.609	8.776	1.723	97	1.013
I		2.839	2.148	417	23	251
II		2.861	2.175	410	24	252
III		3.287	2.573	435	25	254
IV		2.622	1.880	461	25	256
Share %		100	76	15	1	9
Annual Change	Index	113,2	114,6	113,1	107,8	102,2

Source: DANE, DSCN

- **Cross-checking with the vector of Gross Fixed Capital Formation (GFCF) in non-residential buildings**. Once the value of production of non-residential buildings is obtained using CEED and the permits statistics, it is cross-checked with the value derived from the accounts of the institutional sectors for the GFCF vector corresponding to “buildings other than dwellings”.

The value derived from the compilation of GFCF should be larger than the one calculated using CEED and the permits statistics, as the construction carried out within enterprises is not always recorded in the CEED. Additionally, in the GFCF, the value includes taxes, notary fees, commissions and other expenses, related to the property which are not included in the valuation of CEED.

The production values at current and constant prices for each of the groups that comprise the non-residential constructions, before cross-checking with institutional sectors, are included in Table 18:

Table 18. Production of non-residential buildings at current and constant prices 2000-2008

Thousand million pesos

Years	Production non-residential buildings at current prices	Production of non-residential buildings at 2005 constant prices
2000	3.719	6.387
2001	4.027	6.500
2002	5.091	7.023
2003	6.055	7.438
2004	8.285	9.241
2005	9.535	9.535
2006	12.294	11.527
2007	13.694	12.008
2008	16.608	13.749

Source: DANE, DSCN.

- **Civil engineering works**. According to the classification used for the 2005 base national accounts, the works and civil engineering constructions are classified in the following groups and products:

4201 General construction services of civil engineering works

- 420101 General construction services of highways, streets, roads, railways, tunnels and subways, and airfield runways
- 420103 General construction services of harbors, waterways, dams, irrigation and other waterworks.
- 420104 General construction services of long distance and local pipelines, communication and power lines (cables), and related works.
- 420106 General construction services of mines
- 420199 General construction services of others

4202 Rental services related to machinery with operator for construction or demolition of civil engineering works

- 420200 Rental services related to machinery with operator for construction or demolition of civil engineering works

The production of the civil engineering works is calculated, from the expenditure approach, through the expenses of entities that contract others to build their works or the expenses occurred at constructing on own account. As a consequence, production is estimated as the value spent in each period under study in the construction, repair, alteration and restoration of the fixed capital assets other than buildings.

The value of this investment is derived from the accounting records of the public or private enterprises that are the owners of the construction works. The data are provided by the entities in charge of their monitoring, supervising and controlling, such as the General Accounting Office, the Superintendency of Finance, the Superintendency of Companies and the Superintendency of Public Utilities.

For these records, a consolidation system has been devised from which the accounting information is transformed in terms of national accounts through the homologation of the Accounting Standards Framework (PUC). In order to calculate the expenses on civil engineering works, it is necessary to identify those transactions that reflect a GFCF in “other structures other than buildings” in the balance sheets, according to the classifications used in the national accounts.

The method used to obtain the investment made in each reference period consists of deducting from the value that corresponds to the assets in period n the corresponding value in period n-1, and excluding additionally the elements that modify the value of the assets and that do not correspond to the net acquisitions of fixed assets, such as the inclusion or removal of assets, amortizations, valuations, inflation adjustments, etc.

Then, it is necessary to add the operating expenses that have not been capitalized as assets, which are derived from the profit and loss statements. These expenses

are considered as an intermediate consumption within the commodity flow balances (BOU) of the corresponding products.

Production of civil engineering works by product. The civil works production has to be broken down by product. For that purpose, in the balance sheets of corporations, the fixed assets are classified by products according to the national accounts product classification.

Within the asset side of the balance sheets there are two types of items: those that reflect the investment in a single product, for example, the item 164301 “Internal Communication Channels” that exclusively corresponds to product 420101 “Highways, streets, roads, bridges, railroads, tunnels and construction of undergrounds and runways”, and others involving two or more civil work products, such as the item 161504 “Plants pipelines and tunnels” that could correspond to products 420101 “Highways, streets, roads, bridges, railroads, tunnels and construction of undergrounds and runways”, 420103 “General construction services of harbors, waterways, dams, irrigation and other waterworks”, 420104 “auxiliary pipes of great length, lines (cables) of communications and energy, pipes, cables and urban works”, 420106 “General construction services of mines”, and 420199 “General construction services of others”. These items of the balance sheets are assigned to specific products of the classification, according to the main economic activity of the entity reporting them.

In order to calculate the output of product 420200 “Rental services related to machinery with operator for construction or demolition of civil engineering works”, an indirect procedure or method is used, by which the consumption of this service is determined according to the type of civil engineering works in which they are involved. This consumption is obtained from the breakdown of Intermediate Consumption and the respective productive structures for each type of civil engineering work. Table 19 presents the production of civil engineering works for year 2008:

Table 19. Production of civil engineering works

2008 Thousand pesos million

National Accounts codes	Concepts	Value
4201	General construction services of civil engineering works and civil engineering works	35.438
420101	General construction services of highways, streets, roads, railways, tunnels and subways, and airfield runways	9.546
420103	General construction services of harbors, waterways, dams, irrigation and other waterworks	7.218
420104	General construction services of long distance and local pipelines, communication and power lines (cables), and related works	5.699

420106	General construction services of mines	9.826
420199	General construction services of others	2.541
420200	Rental services related to machinery with operator for construction or demolition of civil engineering works	608

Source: DANE, DSCN

5.1.5. Method used to calculate production by economic activity and data sources

For the economic activities which estimation involves several data sources such as economic surveys, financial information from enterprises or government entities, adjustments for productive chains and employment data, the process is more complex; it is particularly so in the case of the economic activities in which small businesses are important, so that part of the production is calculated from the results of the Annual Manufacturing Survey (EAM) and another based on household surveys, considering the latter as an indicator of what happens to unincorporated enterprises. In other industries such as the production of meat, part of its production is estimated from data relating to slaughtered livestock, as this product represents the main intermediate consumption of the industry (production chain technique) and another part from the EAM.

In the economic activities which production is calculated using complementary sources, the data of production of year *n-1*, the starting point for the calculation of year *n*, are disaggregated by sources and for each one of these sources, a specific value index is defined. For example, the production of the industry A is calculated considering two sources, each with its own value indices (Table 20); the production of the industry is obtained by adding the two parts.

Table 20. Industry A. Calculation of production, according to sources

Thousand million pesos

Sources	Production year *n-1*	Value Index	Production year *n*
Total	25.000	-	26.550
1	10.000	105	10.500
2	15.000	107	16.050

Source: DANE, DSCN.

Using this method, in the first stage, the production is calculated at current prices and then, it is calculated at previous year´s constant prices.

- **The sources in the 2005 base year.** In base year 2005, the production of some economic activities was calculated by adding data derived from different sources, for example, information derived from DANE's economic surveys of manufacture, trade or services, or from accounting data compiled by the entities of

surveillance and control (the superintendencies[68] and the General Accounting Office), etc. Once crosschecked these data in order to eliminate duplicates and to reconcile data for common entities[69], they were combined with estimates derived from inputs, or from number of occupied persons in activities or even with adjustments derived from the reconciliation with demand.

Table 21 column 1 lists the different sources defined in the 2005 base year for the calculation of production; column 2 shows for year 2005, the sum of the production for the industries calculated using this method[70] and column 3 lists the sources that have been defined to prepare the accounts of the current years. As explained below, fewer sources are used in current years as compared to the base year. Annex 7 shows the sources: economic surveys, cross-checking survey data with superintendencies data; adjustments for productive chains, analysis of the employment matrix, adjustments for consistency of supply and demand, etc.

Table 21. Value of the production base year 2005, according to sources defined for the calculation of the production of the economic activities, in the base year and current years

Sources '(1)	Value Production (2) (Thousand million pesos)	Sources current years (3)
Adjustments from productive chains	18.757	Adjustments from productive chains
Employment matrix analysis	34.367	Employment matrix analysis
Micro-establishments accounts	23.630	
Family allowance managing funds	1.567	Family allowance managing funds
Central government accounts	31.280	Central government accounts
Local government accounts	30.423	Local government accounts
Adjustments for consistency of supply and demand by product	2.352	Annual Trade Survey (EAC)
Enterprises included in the Annual Trade Survey (EAC-DANE) and that are controlled by the superintendencies	18.483	
Enterprises included in the Annual Trade Survey (EAC-DANE) and that are not controlled by the superintendencies	4.024	
Consistency between supply and use in the manufacturing industry	37.779	Annual Manufacturing Survey
DIAN tax declaration	52.341	
Enterprises included in the Manufacturing Annual Survey (EAM - DANE) and that are controlled by the superintendencies	118.854	
Enterprises included in the Manufacturing Annual Survey (EAM - DANE) and that are not controlled by the superintendencies	28.895	
Superintendency of Companies - SISOC. Enterprises included in DANE's surveys	-2.617	

[68] Superintendency of Companies, of Finance, of Health care, of Family Allowance, of Solidarity Economy, of Securities and of Public Utilities.

[69] For companies that report to more than one source of information (the supervision and control entities and DANE's economic surveys for instance), a specific crosschecking process and analysis was conducted on the information reported to the two sources, in order to obtain a single reconciled value of production for the two sources

[70] Annex 8 lists the sources used for the calculation of production in each of the industries with values for 2008.

Table 21. Value of the production base year 2005, according to sources defined for the calculation of the production of the economic activities, in the base year and current years

Sources '(1)	Value Production (2) (Thousand million pesos)	Sources current years (3)
Superintendency of Solidarity Economy - SISOL. Enterprises included in DANE's surveys	-58	
Superintendency of securities - SIVAL Enterprises included in DANE's surveys	6.025	
Outsourcing	3.776	
Consistency of supply and use in service activities.	1.391	Annual Services Survey (EAS)
Enterprises of DANE's Annual Services Survey, EAS and controlled by the superintendencies	8.404	
Enterprises of DANE's Annual Services Survey, EAS - not controlled by the superintendencies.	7.486	
Non-Profit Institutions	1.584	Non-Profit Institutions Serving Households (NPISH)
Social security	1.749	Social security accounts
Insurance corporations	7.414	Insurance corporations accounts
Financial auxiliaries	3.674	Financial auxiliaries accounts
financial corporations except insurance corporations	5.742	Accounts of the financial corporations except insurance corporations Consistency of supply and use levels concerning the superintendencies information except insurances
Consistency of supply and use levels concerning the superintendencies information	2.374	Supervisions
Public Enterprises (EMPUB) not included in DANE's surveys	11.295	
Corporations followed by the Superintendency of Companies – SISOC, not included in DANE's surveys	19.667	
Entities followed by the Superintendency of Solidarity Economy - SISOL not included in DANE's surveys.	3.015	
Entities followed by the Superintendency of Securities - SIVAL not included in DANE's surveys	3.812	
Superintendence of Public Utilities (SSP)	33.133	

Source: DANE, DSCN.

- **The sources used in the estimation of current years**. From the results of the 2005 base year and from the analysis of the sources used in its calculation and observing that these data sources were not all available in current years, a selection was made regarding which of the sources identified in year 2005 provided an information that could be used for the calculation in current years. Then, all the sources used for the 2005 base were associated with any one of the selected sources, which was then used to provide the indicator of change for all the sources associated with it.

In general terms, the grouping of the sources of the 2005 base year was performed as follows:

The data from the "employment matrix analysis" and "micro-establishments accounts" were associated with the indicator derived from the employment matrix;

- The data from "Consistency of supply and demand by products according to the supply and use tables", the data resulting from cross-checking different sources (EAM, EAC, EAS with superintendencies) whether they were included in more than one of them, or in only one were associated with the indicator constructed in each case from the information of DANE´s annual surveys (EAC, EAM or EAS according to the case);

- In other cases, there is no grouping and instead each source entails its own adjustment derived from the source itself: for example, the adjustments for production chains or those derived from family allowance funds.

- Table 21 column 3 lists the sources defined for the current years and their correspondence with the sources of the 2005 base year.

- Depending on the economic activity, the relative weight of different subgroups varies as is the case of industry 23 "leather tanning and preparation; manufacture of footwear; manufacture of articles of travel, suitcases, handbags and similar; articles of saddlery and harness/Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear" or industry 24 "Transformation of the wood and manufacture of products of wood and cork, except furniture; article manufacture of basketwork and wickerwork" in which the small businesses are important, so that the most important is the employment source, through which the production of small businesses is calculated. In contrast, for industry 10 "Production, processing and preservation of meat and fish", the most important source is that of productive chains, whereas for the industries 51 corresponding to "Financial intermediation", 54 "Public administration and defense; social security of obligatory/compulsory affiliation", and those belonging to the Major Division D " Electricity, gas and water supply", the data come directly from the production accounts of the entities that make them up and that are calculated from available accounting information.

- As an example, in order to calculate the production of year 2008 for industry 23 "Leather tanning and preparation; manufacture of footwear; manufacture of articles of travel, suitcases, handbags and similar; articles of saddlery and harness/ Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear", its estimate was broken down into four groups of sources (Table 22): for the first group, the number of occupied persons derived from the household survey and the minimum wage salary index are used as indicators; for the second group the value index of the production calculated from the results of the EAM is used; in the third group, the value index calculated for enterprises reporting information to the Superintendency of Companies is used and finally for group 4, an adjustment for synthesis and macroeconomic consistency was made in the light of the results obtained from the supply and use table of the current year (2008 in this example).

.Annex 8 shows the composition of the output of industries, calculated by sources for year 2008.

Table 22. Composition by sources of the production of industry 23 "Tanning and dressing of leather; manufacture of footwear; manufacture of luggage, handbags, saddlery, harness and footwear"

2008 Thousand million pesos

Sources	Value
Grand Total	4.146
Employment matrix analysis	1.944
Annual Manufacturing Survey	2.140
Superintendencies	43
Adjustments syntheses matrices	18

Source: DANE, DSCN

- **Indicators used to estimate production in current years**. In order to estimate production of the current years, a value index is defined for each source, first of all at current prices. In the case of the industry, trade and services surveys, the value index is derived from the data on output at current prices; for the source of employment matrix, the value index is the product of the volume index, derived from the number of occupied persons in the industries, and of a price index resulting from the variation of the minimum wage.

As previously explained, in the industries 51 "Financial intermediation", 54 "Public administration and defense; compulsory social security", and those belonging to the Major Division D "Electricity, gas and water supply", the data come directly from the consolidated financial statements of financial corporations, non-financial corporations and government entities from which the value index of output is directly derived.

In the case of the industries which output closely depends on inputs and the data derived from economic surveys only partially cover production, calculations are made on the basis of productive chains[71]. This is the case for example of beef meat, for which part of the production is calculated by taking as the volume indicator, the data from the slaughtering of cattle, or in the sector of milling and bakery products in which the volume indicator is the supply of wheat to the industry. In these cases, the price indicator is usually calculated directly from specific information.

Table 23 lists the sources used to determine the current years' indicator to calculate production. These sources, in general terms, are the following:

- Economic surveys
- The financial information from non-financial corporations and financial corporations supervised by superintendencies.

[71] A productive chain exists when the production of an industry presents a link of direct dependency with one or various intermediate consumptions that are used in the process: the fabric with respect to clothing, the wheat with respect to flour.

- Employment data in which case the price index used is the minimum wage index.
- Estimates from production chains.
- Financial Statements reported by the General Accounting Office

Table 23. Indicators used to calculate production of current years

Sources current years	Indicators used
Adjustments from productive chains	Volume index calculated from the inputs used in the production and price indices proper to each product
Employment matrix analysis	The volume index of the average production of the employed and self-employed workers and the price index from that of the minimum wage
Family allowance management funds	Production calculated from direct information of the family allowance management funds
Central government accounts	Production of the central government derived from the financial statements established by the General Accounting Office[1]
Local government accounts	Production of the local government calculated from data collected by the General Accounting Office
Annual Trade Survey (EAC)	Production calculated from the results of the Annual Trade Survey (EAC)
Annual Manufacturing Survey (EAM)	Production calculated from the results of the Annual Manufacturing Survey (EAM)
Annual Services Survey (EAS)	Production calculated from the results of the Annual Services Survey (EAS)
Non-Profit Institutions Serving Households (NPISH)	Accounts compiled from information on expenditure by the political parties, religious communities and trade unions[2]
Accounts of social security funds	Production calculated from data of the General Accounting Office and information collected directly[3]
Insurance companies	Production of the insurance corporations calculated from the financial statements of the Superintendency of Finance and Superintendency of Health Care (further description in Section 11.2)
Financial auxiliaries	Production of the financial auxiliaries is calculated from the financial statements of the Superintendency of Finance (further description in Section 11.1)
Financial corporations except insurance companies	Production of the financial corporations calculated from the financial statements of the Superintendency of Finance (further description in Section 11.1)
Superintendencies	It refers to the activities of industries, electricity, gas, water, sanitation, and one part from the services to enterprises whose production is calculated from financial information of enterprises supervised by the superintendencies

[1] The methodology used to calculate the production of the government services is explained in Chapter 10.
[2] The methodology used to calculate the production of the Non-Profit Institutions Serving Households (NPISH) is explained in Chapter 13

Source: DANE, DSCN

If the information allows it, it is possible to define growth rates of the products that make up the production of industries: it is the case of data corresponding to the manufacturing

industry, trade and services in which the economic surveys and the adjustments by productive chains, enable breaking down the production of industries by products, in which each of those outputs evolves according to its own indicators. In other cases it is assumed that all the outputs of an industry follow the same behavior as the industry itself; it is the case when using the employment source.

The following sections explain the methodology used to calculate the value indices of production based on the results of DANE's manufacturing, trade and services surveys, those derived from the description of the productive chains and those coming from household surveys as the source of information on employment.

In the case of industry, trade and services surveys, the value indices of the industries are compiled on the basis of a sample of comparable productive units, which means constructing a panel and considering the actual new events of each year: the establishments that report information in years n and n-1 are considered, (even when their value is 0 in year n for being shut down or being inactive in this year), and the new establishments starting operations during year *n*, so as to obtain a value index that reflects the behavior of the industry in the corresponding year.

- **Annual Manufacturing Survey (EAM).** The value indices are calculated based on the information reported in Chapter **VIII** of the EAM. This information is presented by establishments classified according to ISIC Rev 3, A.C., and the production of both main and secondary products in the 8-digit CPC 1.1 classification. Using the existing correspondence between classifications of products and activities of the EAM and codes of products and industries of national accounts, a production matrix is derived, showing for each industry, both its main and secondary outputs. From this matrix and by comparing the results of each industry with those of year *n-1, a* value index by products and industries is established. Table 24 shows as an example, the production values and the resulting value indices from this source (year 2008 as compared with year 2007) for industry 28 "Manufacture of basic chemicals and chemical products except synthetic rubber in primary forms". The value index of the total production of the industry (93.7) is obtained, comparing the values of the sum of the products that are included.

Table 24 Value of production of the industry 28 "Manufacture of basic chemicals and chemical products except synthetic rubber in primary forms"

2007-2008

Thousand million pesos

Products	2007	2008	Value Index
Total	**19.474**	**18.244**	**93,7**
9	39	27	68,8
13	105	64	60,8
14	12	9	76,5
17	26	22	85,1
20	226	163	72,3
21	58	50	85,3
24	3	2	52,7

25	98	65	66,5
27	54	61	113,6
28	18.417	17.348	94,2
29	144	165	114,3
30	51	43	84,6
31	22	16	72,8
32	20	22	108,9
33	94	87	92,4
36	103	99	96

Source: DANE. DSCN and EAM

- **Annual Trade Survey (EAC)**. As indicated above, a panel of comparable enterprises is first set up. On this basis, the information used for the construction of the value index comes from Module 2 (net income accrued by the entrance of merchandise during the year). The value of the main production (commercial margin) is calculated as the total income received from the sale of merchandise, minus the cost of the merchandise sold (row 1 module 4, costs and expenses, inventories and assets). To this value, the income derived from the secondary productions is added. Source by source, the value index is obtained by comparing total values of year *n* and of year *n-1*.

Production of industry = (A+B) - C

Where:
A. Total income from sales of merchandise
B. Other income (repair, maintenance, installation and others) reported in the given year
C. Cost of merchandise sold.

The value index is derived as:

Value of Production year n
---------- = Value index of the trade industry
Value of Production year n-1

The value index as calculated for the source: Annual Trade Survey (EAC, 2008) is shown in Table 25.

Table 25. Value **Index of production calculated using the Annual Trade Survey (EAC)**

2007-2008 Thousand million pesos

Concept	2007	2008	Value Index
Production	21.957	23.093	105,17

Source: DANE, DSCN and EAC

- **Annual Services Survey (EAS).** As in the case of other surveys, a panel of comparable enterprises is first extracted for calculations. On this basis, the information used to estimate the value index of production is derived from Chapter III, which includes the operational income corresponding to each service, as well as non-operational income, such as interests. From this chapter the production by class of products is established. The service industries and their related products covered by the EAS are listed in Table 26.

Table 26. Services industry surveyed by the Annual Services Survey (EAS)

Services Industries	Products
45. Hotels, bars, restaurants and similar establishments	• 4501 Lodging services • 4502 Food and beverage serving services
50. Post and telecommunications	• 5002 Telecommunications services
53. Renting and business activities	• 530102 Licensing services for the right to use computer software; computer consultancy services; online information provision services; data processing services; computer hardware servicing, repair and maintenance, etc. • 530201 Advertising services • 530202 Employment agency services and supply of personnel services • 530203 Private investigation and security services • 530204 Cleaning services • 530205 Photographic services
59. Other market community, social and personal service activities, except sewage and refuse disposal, sanitation and similar activities	• 600002 Motion picture, video tape, television and radio programme production and distribution services • 600004 Services of radio and television (production) • 600006 News agency services

Source: DANE, DSCN and EAS.

- **Productive Chains.** Some economic activities due to their size, dispersion, geographic location and the place where the production takes place are not included in economic surveys or are underrepresented. In order to correct this situation, indirect methods were devised to enable approaches to the transactions not captured in the statistical records. The productive chains are one of them.

A productive chain occurs when the production of an industry presents a direct dependency relationship with one or several of the inputs used in the process. From that standpoint, it is possible to establish the levels of production or of intermediate consumption as soon as any of them is known. For this purpose, the coherence between quantities and the values of the main input and the corresponding production is analyzed. Thus, for instance, the quantity of wheat flour that enters into intermediate consumption is directly linked with the level of production of bread, pastas and products that use this product as input. In the case of building materials like bricks, concrete, etc., they are directly linked with the levels of production of construction; the same occurs with parchment coffee which is a direct input of the production of green coffee.

According to the above, the volume and price indices of the output of some industries are estimated based on the dependency relationships between the characteristic output of these industries and the typical intermediate consumptions used in the process. Thus, for instance, part of the production of meat and sub-products derived from the slaughtering of bovine cattle is calculated taking into account the main input that is the cattle for slaughtering, data that are available annually and are considered reliable. As a consequence, comparing the data of cattle for slaughtering of years 2008 and 2007 (expressed in kilograms), a volume index of 106.77 is obtained, that is used as reference during the whole construction process of the productive chain.

Kilograms of cattle for slaughtering year 2007 = 1.595.057.005
Kilograms of cattle for slaughtering year 2008 = 1.702.997.049

Volume index = 1.702.997.049/ 1.595.057.005 = 106,77

The total production of the slaughtering of cattle industry, expressed in terms of kilograms of slaughtered cattle, obtained for year 2008[72] is broken down into products and by-products (meat, tallow, leathers,) from the coefficients of conversion established for year 2005. Table 27 shows the quantities, the prices[73] and the values in thousand million pesos for this product.

Table 27. Total production of products and sub-products derived from the slaughtering of bovine cattle

2008

National Accounts Product	Description of National Accounts product	Products of the production chain	Production (Tons)	Price (kilograms)	Value (Thousand million pesos)
		Total available	1.702.998		6.385
100101	Meat of bovine animals, fresh or chilled	Carcass meat	902.588	5.771	5.209
110001	Fats of bovine animals, sheep, goats, pigs and poultry, raw or rendered; wool grease.	Tallow			
		Subcutaneous Fat	204.360	612	125
100105	Hides and skins o bovine, sheep. go equine and other animals	Hides			
		Leather	272.480	1.635	445
100104	Edible offal of bo swine, and other animals, fresh or	Despoliation			

[72] The same calculation is made for 2007 and prior years.
[73] The price for valuing quantities corresponds to the implicit price of production associated with the CPC codes of the products of the chain - source: EAM

chilled.

Head	17.030	1.768	30
Extremities	17.030	3.535	60
Guts			
Organs	97.071	2.707	263
Visceral Fat	34.060	1.112	38
Booklet and stomach	44.278	2.964	131
Intestine	63.011	1.112	70
Blood	51.090	280	14

Source: DANE, DSCN.

Once the values of each of the products are obtained, they are added according to the national accounts product classification and the total value of the production of meat and sub-products for year 2008 is obtained (Table 28, column 1). On the other hand, part of the production of meat and sub-products is derived from the EAM, with an estimated value of 613 thousand million pesos for year 2008[74]. The adjustment to be made per productive chain is determined as the difference between the total production of meat and sub-products calculated using the productive chain method and the value derived from the EAM. The results of the adjustment appear in column 3 of Table 28.

Table 28. Aggregation in terms of NA products and estimate of the adjustment for productive chain

2008

Thousand million pesos

National accounts codes	National Accounts Product description	Total Production	Value EAM	Adjustment for productive chain 2008
		(1)	'(2)	(3)= (1) - (2)
100101	Meat of bovine animals, fresh or chilled	5.209	408	4.801
100104	Edible offal of bovine, swine, and other animals, fresh or chilled	606	24	582
110001	Fats of bovine animals, sheep, goats, pigs and poultry, raw or rendered; wool grease	125	7	118
100105	Hides and skins of bovine, sheep. goat, equine and other animals	445	29	416
100300	Slaughter, slaughterhouse and other services related to manufacturing of	246	145	101

[74] This value corresponds to the production of the slaughter houses included in the EAM

	meat and fish, on a fee or contract basis			
		6.631	613	6.018

Source: DANE, DSCN

Comparing the values of the adjustments for productive chains calculated for years 2007 and 2008, the value index corresponding to the source “productive chains”, (Table 29) is determined. The total value of production of the industry is the sum of the value of production of the main and secondary products.

Table 29. Estimation of the value index for the source “Productive Chains”, by products

2008

Thousand million pesos

National accounts Code	National Accounts Product description	Adjustment for productive chain 2007	Adjustment for productive chain 2008	Value Index 2008
Total		**5.540,0**	**6.018,0**	**108,6**
100101	Meat of bovine animals, fresh or chilled	4.470,0	4.801,0	107,4
100104	Edible offal of bovine, swine, and other animals, fresh or chilled	490,0	582,0	118,8
110001	Fats of bovine animals, sheep, goats, pigs and poultry, raw or rendered; wool grease	83,0	118,0	142,2
100105	Hides and skins of bovine, sheep. goat, equine and other animals	407,0	416,0	102,2
100300	Slaughter, slaughterhouse and other services related to manufacturing of meat and fish, on a fee or contract basis	90,0	101,0	112,2

Source: DANE, DSCN.

Table 30 presents the products for which calculations are made using the productive chain method according to the national accounts product classification.

Table 30. Products whose estimated production includes adjustments for productive chains

National Accounts Code	National Accounts product description
100101	Meat of bovine animals, fresh or chilled
100102	Swine meat, fresh or chilled
100103	Meat of ovine, goat and other animals, fresh or chilled
100104	Edible offal of bovine, swine, and other animals, fresh or chilled.
100105	Hides and skins of bovine, sheep, goat, equine and other animals
100106	Meat and edible offal of poultry and other meats, fresh or chilled
100201	Fish fillets; fish, dried, salt or smoked
100202	Crustaceans, frozen; mollusks and other aquatic invertebrates, frozen, dried, salted or in brine
100300	Slaughter, slaughterhouse and other services related to manufacturing of meat and fish, on a fee or contract basis
110001	Fats and oils of bovine cattle, live, goat ovine or, of pig, birds and others of origin animal or vegetable, raw or fused, refined or no; wool fats
110003	Raw vegetable oils
110006	Oil seeds and oleaginous fruit Palm kernel, flocks, cakes and flours; waxes of vegetal origin
120003	Cheese and curd
120005	Butter and other fats and oils derived from milk or cream
120006	Other dairy products
130201	Products of bakery
140101	Milling on a fee or contract basis
140102	Green coffee
310103	Precious metal ores and concentrates
360100	Jewelry and related articles

Source: DANE, DSCN

- **Analysis of the employment matrix**. The indicator of value used to establish the change pattern of the employment matrix is derived from the volume index of full-time equivalent jobs and a price index specific to each economic activity. In order to calculate the volume of full-time equivalent jobs, the section H of the Great Integrated Household Survey (GEIH) (the labor force survey) is used. This section provides information on the occupational categories of the workers, their economic activity and the hours worked.

To the annual change by activity of full-time equivalent jobs (EETC)[75] by industry, a price index is applied derived from the analysis of the EAM for each of the corresponding manufacturing industry, or from total CPI for some services. Table 31 presents the example of the calculation of the value index for industry 22 “Manufacture of wearing apparel, including knitted and crocheted fabrics and articles; dressing and dyeing of furs; manufacture of articles of fur”, and Table 32

[75] EETC= Number of employed workers * Adjustment Coefficient; adjustment coefficient = Effective average working days per week/ Full time working days per week

presents the value indices calculated for other manufacturing activities that are obtained using the employment matrix as source.

Table 31. Calculation of the value index of production of the economic activity "Manufacture of wearing apparel, including knitted and crocheted fabrics and articles; dressing and dyeing of furs; manufacture of articles of fur"

2007-2008

ISIC Classification	Hours per week worked	Adjustment	Number of occupied persons	Full-time equivalent jobs
2007				
1.810	44,00	0,92	392.498	359.790
2008				
1.810	46,00	**0,96**	369.771	354.364
Volume index	96,5a	--	--	97
Price Index	101,9b	--	--	--
Value Index	98,3c	--	--	--

Source: DANE, DSCN.

[a]The volume index is the result of comparing full-time equivalent jobs of year *n* to those of year *n-1*

[b] The price index is obtained from the EAM for the corresponding characteristic products

[c] The value index results from multiplying the volume index by the price index

`--: not applicable

Table 32 shows how most economic activities of national accounts are affected by the use of this source of information.

Table 32. Volume, price and value indices, of production according to economic activities using the employment matrix as source for some of its components

2008

National accounts codes	National accounts economic activities	Volume index	Price Index	Value Index
10	Production, processing and preservation of meat and fish	97,7	102,69	100,3
12	Manufacture of dairy products	101,4	114,6	116,2
13	Manufacture of grain mill products, starches and starch products, prepared animal feeds, bakery products, macaroni, noodles, couscous and similar farinaceous products	97,8	116,2	113,7
17	Manufacture of other food products n.e.c.	99,7	105,8	105,5
18	Manufacture of beverages	110,2	105,6	116,4
19	Manufacture of tobacco products	101,6	111,57	113,4

20	Preparation and spinning of textile fibres, weaving of textiles, and finishing of textiles produced in other production unit	96	103,7	99,6
21	Manufacture of other textiles	107,8	100,5	108,3
22	Manufacture of wearing apparel, including knitted and crocheted fabrics and articles; dressing and dyeing of fur; manufacture of articles of fur	98,6	101,85	100,3
23	Tanning and dressing of leather; manufacture of footwear; manufacture of travel accessories, luggage, handbags, saddlery and harness	101,6	103,5	105,2
24	Processing of wood, manufacture of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	99,6	103,75	103,3
26	Publishing and printing	101,2	97,9	99,1
28	Manufacture of basic chemicals and chemical products except synthetic rubber in primary forms	103,9	103,1	107,1
30	Manufacture of other non-metallic mineral products	102,1	105,3	107,5
35	Manufacture of furniture;	106,2	102,3	108,6
36	Other manufacturing n.e.c.	108,2	97,8	105,8
43	Wholesale and retail trade	104,8	107,3	112,4
45	Hotels, restaurants, bars and similar establishments	104,4	107,3	112
49	Supporting and auxiliary transport activities; activities of travel agencies	92	111,2	102,3
50	Post and telecommunications	104,9	107,3	112,6
51	Financial Intermediation, including insurance and pension and severance funds	98,1	107,3	105,3
53	Renting and business activities	105,4	107,3	113,1
59	Other market community, social and personal service activities except Sewage and refuse disposal, sanitation and similar activities	107,1	107,3	114,9

Source: DANE, DSCN.

See description of classification in Annex 2

5.2. ESTIMATION OF HOUSEHOLD FINAL CONSUMPTION EXPENDITURE

Household Final Consumption Expenditure (HFCE) represents the consumption of goods and services acquired by resident households in the country or abroad. It includes all durable and non-durable goods and services acquired by resident households to satisfy their individual needs and wants: food, clothing, footwear, fuels, electric home appliances, automobiles, furniture, health, legal, education, and transport services, rental of dwellings, those actually paid as well as those imputed on owner-occupied dwellings, services provided by employing paid domestic staff, production of goods on own-account, partial payments for non-market government services (for example, student tuitions in public universities, and the entrance fees to museums).

It excludes the goods and services provided by government and NPISHs as social transfers in kind, for example, those corresponding to health care services, education, etc., which are included in the final consumption expenditure of those entities.

For the compilation of National Accounts for current years, the calculation method of HFCE has been set to reflect both the economic cycles and the actual conditions of demand. In a first stage, the 2000-2008 HFCE series was established by products and subsequently, the data corresponding to year 2009 and followings were calculated using the same method.

Before reconciling HFCE with supply[76], the 2000-2008 series of HFCE was calculated based on the information sources available derived from the Living Condition Surveys, (ECV[77]) of years 1997, 2003 and 2008, the Monthly Retail Trade Survey (MMCM[78]) combined with the income of households as reported in the Continuous Household Survey (ECH[79]) as well as with data included in the Great Integrated Household Survey (GEIH[80]). This information was complemented with specific researches on the incidence of cigarette consumption and illicit substances and other indicators[81].

For some other products such as the rentals of dwellings and education services, consumption is the only element of demand or its main component, which explains why there are no exogenous estimates for HFCE within the expenditure approach, and HFCE is calculated based on production indicators. The methodology used in each of these cases is described in the following sections.

5.2.1. The use of the Living Conditions Surveys (ECV).

The ECV of 1997, 2003 and 2008 are used to define the trends of the composition of household final consumption expenditure; because of the changes in tastes and habits of consumption, some products increase or decrease their share within total expenditure. For instance, prepared meals tend to increase their share in expenditure on food, while tubers present a decline.

From the analysis of the trends pictured in the series of ECV, approximately 60% of the variations of the products that make up HFCE are calculated.

First of all, the universe of goods and services consumed by households is segmented into two categories: (1) food and non-alcoholic beverage and (2) rest of goods and services. Each category groups product items of the ECV classification corresponding to one or more products of the national accounts product classification.

The trends of household consumption are defined separately for each category, following the stages described below:

1. On the basis of the results of the successive ECVs, the percentage shares corresponding to the consumption of each product are calculated, as compared to the total of each category given by each ECV. From this result, it is possible to

[76] This HFCE corresponds to the one obtained in the first stage of the compilation of National Accounts, where each element of supply and of demand is calculated autonomously. Thereafter, the synthesis process is carried out on a second stage, by cross-checking supply and demand data and thereby adjusting its macroeconomic consistency. Chapter 6 explains the process of synthesis of transactions on goods and services.
[77] For its Spanish acronym
[78] For its Spanish acronym
[79] For its Spanish acronym
[80] For its Spanish acronym
[81] The income and expenditure surveys that provide information for the HFCE at detailed level have a low periodicity (the last ones corresponded to 1994-1995 and 2006-2007). Therefore, these surveys were only used for the estimate of the 2005 year base.

establish the trends of those shares for the 1997-2008 period, in terms of the ECV´s product classification;

2. Based on the data corresponding to the 2005 national accounts year base, the aggregated value of HFCE for year 2005 for each of the two categories (1) food and non-alcoholic beverage and (2) rest of goods and services is calculated. For this purpose, the correspondence between the ECV product classification and that of national accounts is used;

3. Starting with the total value of HFCE for year 2005, (as calculated in phase 2) the series 2000 to 2008 for those aggregates is established, based on the assumption that for both categories, HFCE grows in volume as total population[82], whereas the total change in price follows the change of the Consumer Price Index (CPI), the one corresponding to food for the first category, and total CPI for the second one;

4. The total values of HFCE for each category obtained for years 2000-2008 (phase 3) are distributed among products using the shares derived from the sequence of ECVs (phase 1) and annual changes of HFCE are calculated for each product;

5. For each national accounts product, a provisional version of annual changes in value and prices is calculated, from which it is possible to derive a first estimation of changes in volume: changes in value come from the ECVs (phase 4), and changes in prices are derived from the CPI;

6. Finally, in order to take into consideration the relative stability of households consumption habits, the consumption of a year is estimated as a weighted average of the previously estimated provisional volumes corresponding to years (n) and (n-1)

The procedure followed to estimate the consumption by detailed products for the category (1) “food and non-alcoholic beverage” is presented below in detail. The same procedure applies for category (2) “rest of goods and services”.

Phase 1: Calculation of the shares of the products belonging to the category (1) “food and non-alcoholic beverage” within the Living Condition Surveys (ECV)

Using the results of the Living Condition Surveys 1997, 2003 and 2008, the share of the expenditure in each product in the total for the category can be established (Table 33).

Table 33. Percentage shares of the products within the category (1) “Food and non-alcoholic beverages” according to the different Living Condition Surveys (ECV)

1997, 2003 and 2008

Items	Percentage Share		
	ECV 1997	ECV 2003	ECV 2008
Total	100,0	100,0	100,0
Bread, *arepas*, buns, *almojábanas*	6,6	8,0	7,0
Milk and products derived from milk (milk cheese, curd,			9,2

[82] Meaning that average consumption in volume per person does not vary in the period

kumis, yogurt, cream, butter)	9,8	9,4	
Eggs	3,6	4,4	4,2
Beef, pork and lamb, bone and guts	14,8	12,5	12,7
Poultry meat	6,1	6,2	7,1
Freshwater fish or saltwater fish or other fresh or frozen marine products	2,8	3,8	2,8
Sausages, ham, mortadella, sausage and other prepared cold meats	1,6	1,9	2,4
Common potatoes, creole potatoes and cassava, *arracacha*, yam	6,8	5,9	5,6
Rice, pasta, oat, wheat flours, *cornflakes* and other cereals	8,9	9,3	10,2
Kidney beans and peas	11,0	9,6	9,8
Green or sweet plantains	3,3	3,2	2,9
Fresh bananas, guava, orange, lemon, mango, papaya, apple, pineapple, blackberries and other fruits	6,2	5,5	6,1
Oil, butter, margarine and other fats	3,8	4,7	4,9
Sugar, salt, spices and sauces	3,4	3,8	3,4
Panela, coffee, chocolate, tea	4,6	4,6	4,4
Snacks, candies, patacons, soda powder and other snacks	1,8	1,8	1,7
Canned food (peas, tuna, sardines, sausages)	1,2	1,5	1,6
Crackers and cookies	2,6	2,6	2,6
Soft drinks, malts and processed juices more water purchased in tanks, from water carriers or bottled water	1,1	1,3	1,4

Source: DANE, DSCN

As it can be observed, the calculated shares have a relatively regular behavior during the period, without abrupt changes among the observed years, and well represent the general dynamics of the economy. For instance, the share of the product “poultry meat” shows a tendency to increase, from 6,1% in the 1997 ECV to 7,1% in the 2008 ECV whereas that of “beef, pork and lamb” tends to decrease, moving from representing 14,8% of total expenditure in food in 1997, to 12,7 % in 2008 (Table 33).

From the shares established for years 1997, 2003 and 2008 based on ECVs (Table 33), linear tendencies were estimated to interpolate the data for the years in which such information was not available, that is, supposing a stable dynamics of consumption. For instance, for the group “dairy products”, its series of shares for the 1997-2008 period is presented in Table 34.

Table 34. Shares of the group 'dairy products' in the total category `food and non-alcoholic beverages'
1997-2008

Years	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
% Share	9,8	9,8	9,7	9,6	9,5	9,4	9,4	9,3	9,3	9,3	9,2	9,2

Source: DANE, DSCN

Phase 2: Aggregation of the value of HFCE of base year 2005 into the category "food and non-alcoholic beverages"

On the basis of the value of HFCE by national accounts products calculated for the year 2005, it is possible to establish the level of the category "food and non-alcoholic beverages". For this purposes, the correspondence between the classification of products used in the ECV and that of national accounts is used, aggregating the values reported in the national accounts according to the ECV products. Table 35 shows this correspondence and the total value corresponding to the category "food and non-alcoholic beverages".

Table 35 Correspondence between the product classification of the Living Conditions Surveys (ECV) and that of National Accounts[83]

2005 Million pesos

Product coding and description (ECV)		Product coding and description National Accounts		HFCE National Accounts base year 2005
	Total food and non-alcoholic beverages			**46.587**
1	Bread, *arepas*, buns, *almojábanas*	130201	Bakery products	3.307
2	Milk and products derived from milk (cheese, curd, kumis, yogurt, cream, butter)	030102	Raw milk and milk cream	791
		120001	Pasteurized and ultrapasteurized milk	1.405
		120002	Concentrated milk and cream in solid forms	658
		120003	Cheese and curd	1.562
		120004	Yogurt and other fermented milk	480
		120005	Butter and other fats and oils derived from milk or cream	172
		120006	Other dairy products	1.264
3	Eggs	030202	Eggs, in shell, fresh, preserved, cooked or embryonated	1.355
4	Beef, pork and lamb, bones and offal	100101	Meat of bovine animals, fresh or chilled	3.375
		100102	Swine meat, fresh or chilled	955
		100103	Meat of ovine, goat and other animals, fresh or chilled	21
		100104	Edible offal of bovine, swine, and other animals, fresh or chilled.	406
5	Poultry meat	100106	Meat and edible offal of poultry and other meats, fresh or chilled	2.796
6	Freshwater fish or saltwater fish or other fresh or frozen marine products	050101	Saltwater fish, live, fresh or chilled; services related to fishing and fish farming	51

[83] The national accounts classification that is used in this case is that corresponding to the classification for back-casting, i.e. to the classification used for the compilation of the national accounts of the 2000-2005 series. Refer to classification in Annex 3 of this document.

		050102	Freshwater fish, live, fresh or chilled	380
		050200	Crustaceans; oysters; other invertebrates; other aquatic products (shells, sponges, seaweed, etc.)	118
		100201	Saltwater fish, live, fresh or chilled	645
		100202	Freshwater fish, live, fresh or chilled	522
		100203	*Crustaceans; oysters; other aquatic invertebrates; other aquatic products*	1
7	Sausages, ham, mortadella, sausage and other prepared cold meats	100108	Preserves and preparations of meat	1.066
8	Common potatoes, creole potatoes, cassava, arracacha, yam	020201	Potatoes	1.205
		020207	Cassava	602
		020299	Other edible roots and tubers with high starch or inulin content	428
9	Rice, pasta, oat, wheat flours, *cornflakes* and other cereals, crackers and cookies	020102	Maize	267
		130101	Flour from wheat or other cereal, meal or groats	592
		130102	Milled rice (polished or white) semi- or wholly milled; mixes for bakery	2.426
		130103	Other vegetable flours and meals; and mixes for bakery	10
		130104	Starches and starch products; sugars and sugar syrups n.e.c.	3
		130202	Macaroni, noodles, and similar farinaceous products	523
10	Dry kidney bean, dry peas, lentils, chick-peas and other grains	020202	Fresh and dried leguminous vegetables;	864
		020204	Tomato	327
		020205	Other vegetables, fresh or chilled n.ep (onion, garlic, beet, mushrooms, etc.)	1.230
11	Green or sweet plantains	020302	Fresh plantains	1.282
13	Fresh bananas, guava, orange, lemon, mango, papaya, apple, pineapple, blackberries and other fruits	020301	Fresh bananas	168
		020303	Citrus fruits (orange, lemon, mandarine and other citrics (grapefruit, tangelo, etc.);	803
		020399	Other fresh fruits and nuts; Coconuts, pineapples, figs, mangoes, guavas, fresh or dried other fresh fruits and nuts n.e.c	1.870
14	Oil, butter, margarine and other fats	110004	Refined vegetable oils	503
		110005	Margarine and analogous products	1.438
15	Sugar, salt, spices and sauces	150001	Raw cane or beet sugar, refined or not; Services related to elaboration and refining of sugar and panela	768
16	Panela, coffee, chocolate, tea	140201	Roasted or non-roasted coffee, decaffeinated or not, in grains or ground	351
		140202	Instant coffee and substitutes and Coffee	

			extract	89
		150002	Panela	1.290
		160100	By-products of cocoa, cocoa and chocolate	674
17	Snacks, candies, patacons, powder for soft drinks and other snacks	160200	*sugar confectionery with or without chocolate*	808
18	Canned food (peas, tuna, sardines, sausages)	170101	Vegetables; frozen, dehydrated; canned or preserved	119
		170102	Fruits and vegetables juices	130
		170103	Fruits and nuts; dried, boiled or not, roasted or salted peanuts; fruit pulp and other preserved fruits	111
		170104	Jams, fruit jellies and fruit or nut puree and pastes	94
		170201	Homogenised preparations of meat, vegetables, fruit or nuts; preparations of milk, flour, meal, starch or malt extract, for infant use n.e.c.; homogenised composite food preparations	70
		170202	Soups and broths and preparations thereof	249
		170203	Sauces; mixed condiments; and other	387
20	Soft drinks, malts and processed juices and water purchased from tanks, water carriers or bottled water	180301	Non-alcoholic beverages	4.019

Source: DANE; Living Conditions Surveys and DSCN

Phase 3: Calculation of the level of consumption of the category "food and non-alcoholic beverages"

The assumptions used for the estimation of the changes of the total value of consumption of category (1) "food and non-alcoholic beverages" are as follows: in volume, the category grows at the same rate as the total population (column (1), table 36); in prices, the category has the same trend as the CPI for food[84] (column (2), table 36). From these assumptions, a first approximation of the series of the changes in value of this category is derived (column (3), Table 36).

The changes in the value of consumption are applied to the value of the whole category in year 2005 (45.030 thousand million pesos), and the results are presented in Table 36 column (4)).

Table 36. Annual growth rates of the value of Household Final Consumption Expenditure (HFCE) for the grouping (1) "food and non-alcoholic beverages" 2000-2008

[84] For category (2) rest of goods and services, the price indicator is the one corresponding to total CPI.

Years	Total population annual growth rate (%)	Annual growth rate of the CPI corresponding to "food and non-alcoholic beverages" (%)	Annual corresponding growth rate of the value of "food and non-alcoholic beverages" (%)	First estimated value of "food and non-alcoholic beverages" (Thousand million pesos)
	(1)	(2)	(3)	(4)
2000				29.144
2001	1,3	10,5	12,0	32.642
2002	1,3	10,9	12,3	36.657
2003	1,3	5,3	6,7	39.113
2004	1,2	5,4	6,7	41.733
2005	1,2	6,6	7,9	**45.030**
2006	1,2	5,7	7,0	48.182
2007	1,2	18,5	19,8	57.722
2008	1,2	13,2	14,5	66.092

Source: DANE; DSCN

(3) is derived from combining (1) and (2)

(4) is derived from applying successive growth rates (3) starting with the 2005 value (the base year)

Phase 4: Distribution of the total HFCE by product, 2001-2008 series

The total value of the projected HFCE for the category “Food and non-alcoholic beverages” (calculated in phase 3) is broken down by products based on the shares calculated in phase 1.

For example, in the case of “dairy products”, the value of consumption is obtained by multiplying the total projected value of consumption for “Food and non-alcoholic beverages” (column (1) table 37), by the share of “dairy products” according to the ECVs, (column (2)).

Table 37 presents this first approximation to the value of consumption in “dairy products” (column (3) and its corresponding annual growth rates (column 4).

Table 37: Calculation of the change in value of the consumption of "dairy products"

2001-2008 (First estimation)

Years	First estimated value of GFCE for the grouping (1) "food and non-alcoholic beverages" (thousand million pesos)	Share of "dairy products" within the grouping "food and non-alcoholic beverages" (%)	First estimated value of "dairy products" (thousand million pesos)	Yearly growth rate (in value) (%)
	(1)	(2)	(3) = (1) x (2)	(4)
2000	29.144	9,6	2.798	
2001	32.642	9,5	3.101	10,8
2002	36.657	9,4	3.446	11,1
2003	39.113	9,4	3.677	6,7

2004	41.733	9,3	3.881	5,6
2005	45.030	9,3	4.188	7,9
2006	48.182	9,3	4.481	7,0
2007	57.722	9,2	5.310	18,5
2008	66.092	9,2	6.080	14,5

Source: DANE, DSCN

(1) from table 36 (column (4))

(2) from table 34

The operations described in Table 37 were performed for the other groups of products belonging to the category and the corresponding growth rates of their value are shown in Table 38.

Table 38. Annual growth rates of HFCE, according to groups of products of the Living Condition Surveys (ECV)
2001-2008

Description of products according to ECV	2001	2002	2003	2004	2005	2006	2007	2008
Bread, *arepas*, buns, *almojábanas*	14,0	13,7	12,4	4,9	4,8	4,1	6,7	9,8
Milk and other dairy products (cheese, curd, kumis, yogurt, cream, butter)	9,5	9,4	8,2	7,2	7,1	6,5	9,1	12,4
Eggs	13,8	13,6	12,3	6,6	6,6	6,0	8,6	11,9
Beef, pork or lamb, bones and offal	7,4	7,2	6,0	7,2	7,1	6,5	9,2	12,5
Poultry Meat	11,0	10,8	9,7	10,3	10,2	9,5	12,2	15,5
Freshwater fish or saltwater fish or other fresh or frozen marine products	16,2	15,8	14,3	2,2	1,8	0,9	3,1	5,8
Sausages, ham, mortadella, sausage and other prepared cold meats	13,7	13,4	12,2	14,1	13,7	12,7	15,2	18,4
Common potatoes, Creole potatoes, cassava, *arracacha,* yam	7,8	7,6	6,4	6,4	6,4	5,7	8,4	11,6
Rice, pasta, oat, wheat flours, *Cornflakes* and other cereals, crackers and cookies	11,2	11,0	9,9	9,6	9,5	8,8	11,5	14,8
Dry kidney bean, dry peas, lentils, chick-peas and other grains	7,9	7,7	6,5	8,1	8,1	7,4	10,1	13,4
Green or sweet plantains	9,9	9,8	8,6	5,4	5,3	4,6	7,2	10,4
Fresh bananas, guava, orange, lemon, mango, papaya, apple, pineapple, blackberries and other fruits	8,2	8,0	6,8	10,0	9,9	9,2	11,9	15,2
Oil, butter, margarine and other fats	14,4	14,1	12,8	8,2	8,2	7,6	10,2	13,6
Sugar, salt, spices and sauces	12,4	12,2	11,0	5,5	5,4	4,8	7,3	10,5
Panela, coffee, chocolate, tea	10,7	10,5	9,4	6,7	6,6	6,0	8,6	11,9
Snacks, candies, *patacons*, powders for soft drinks and others snacks	10,5	10,3	9,2	6,2	6,2	5,6	8,2	11,4
Canned food (peas, tuna, sardines, sausages)	15,1	14,8	13,4	8,5	8,5	7,8	10,5	13,8
Soft drinks, malts and processed juices and water purchased from tanks, water carriers or bottled water	10,0	9,9	8,7	7,7	7,6	7,0	9,7	13,0

Source: DANE, DSCN

Phase 5: Calculation of the changes in value, price and volume of HFCE in terms of national accounts products, 2000-2008 series

In order to calculate the changes in the value of HFCE at the level of detail of the national accounts product classification, the changes in value calculated in phase 4 were used; when a product of the ECV classification corresponded to various national accounts products, the same change was applied to all corresponding national accounts products.

For the change in prices, the CPI information was used at the level of the national accounts products, using a correspondence between the national accounts product classification and that of CPI. In the cases in which a given national accounts product corresponded to more than one CPI item, the price indices corresponding to the different items were combined based on their value in the 2006-2007 Income and Expenditure National Survey[85] (ENIG).

In the cases where an ECV product corresponded to various national accounts products, the difference in the changes in price of those products was used as an indicator of the shortage or abundance of the corresponding product, a procedure which enables capturing the possible substitutions among products.

The substitution between products is reflected in the differences in the changes of relative prices of the products that made up a unique item of the classification. For instance, the item "Panela, coffee, chocolate, tea" maintains a stable share in the ECV overtime; however, when analyzing independently the products included in the item, it is possible to determine differentiated evolution of prices, and thus of volume.

Another example is that of the ECV product "common potatoes, creole potatoes, cassava, arracacha, yam"; it corresponds to two products in the national accounts product classification: on the one hand, the product "potatoes" and on the other, "Cassava and other edible roots and tubers with high starch or inulin content". For each of these products, the starting point is the same change in the value of the ECVs item, but different changes in prices lead to different volume indices. Table 39 illustrates the calculation made in the case of the products "potatoes" and "Cassava and other edible roots and tubers with high starch or inulin content".

Table 39. Price, Value and Volume annual growth rates for "Potatoes" and "Cassava and other edible roots and tubers with high starch or inulin content"

2001-2008

Years	Potatoes			Cassava and other edible roots and tubers with high starch or inulin content		
	Value annual growth rate	Price annual growth rate	Volume annual growth rate	Value annual growth rate	Price annual growth rate	Volume annual growth rate
	(1)	(2)	(3)	(1)	(2)	(3)
2001	7,8	-5,5	14,1	7,8	5,8	1,9
2002	7,6	16,9	-8,0	7,6	-15,7	27,6

[85] See Annex 11: correspondence between the national accounts product classification and that of CPI

2003	6,4	5,9	0,5	6,4	12,9	-5,8
2004	6,4	-2,8	9,5	6,4	15	-7,5
2005	6,4	28,6	-17,3	6,4	-8,6	16,4
2006	5,7	4,7	1,0	5,7	8,9	-2,9
2007	8,4	-15,2	27,8	8,4	22,7	-11,7
2008	11,6	52,1	-26,6	11,6	-2,4	14,3

Source: DANE, DSCN

(1) The value annual growth rate is obtained by comparing the value for a given year with that of the previous year

(2) The price annual growth rate is obtained by comparing the levels of the corresponding average annual CPI

(3) The implicit volume annual growth rate is obtained combining (1) and (2)

This table illustrates that, although several national accounts products have the same value index, specific price indicators lead to different implicit changes in volume.

For year 2002, for example, both “Potatoes” and “Cassava and other edible roots and tubers with high starch or inulin content” increased their value by 7,6%, but the increase in prices of “potatoes” is approximately 17% whereas the prices of “Cassava and other edible roots and tubers with high starch or inulin content” fell 15,7%, which is the reason why the change in volume of “potatoes” is negative (-8%) whereas that of “Cassava and other edible roots and tubers with high starch or inulin content” is positive (27,6%).

Phase 6: Restrictions on the changes in volume

A feature of this method is the inverse relationship between price and volume changes. However, this relationship may not be that strict because the traditions and habits of consumption inhibit the total adjustment of demand to the fluctuations of prices.

To take this aspect into account, a weighted average of the volume index corresponding to the previous year (weight 0.35) and that of the current year (weight 0.65) was calculated, so that the volume change of the current year would also take into consideration the trend of consumption observed in the previous year.

Following the previous example of the product “potatoes”, the changes in volume are expressed in terms of indices with a fixed reference year[86] (here year 2000) (table 40, column (1), in order to calculate the weighted volume index (table 40, column (2)). Finally, the annual growth rates of the volume index are derived (table 40, column (3)).

Table 40. Final forecast of the volume index of consumption for “Potatoes” 2000-2008

Years	Volume index previous year = 100	Volume index Year 2000 =100	Weighted Average (t-1*0,35) + (t*0,65)	Anual volume growth rate
	(1)	(2)	(3)	(4)
2000		100,0		
2001	114,1	114,1	109,1	9,1
2002	92,0	105,0	108,2	-0,9

[86] This is required in order to combine the indices

2003	100,5	105,5	105,3	-2,6
2004	109,5	115,5	112,0	6,3
2005	82,7	95,5	102,5	-8,5
2006	101,0	96,5	96,1	-6,2
2007	127,8	123,3	113,9	18,5
2008	73,4	90,5	102,0	-10,5

Source: DANE, DSCN

(1) The volume index relative to the previous year was derived from the calculation of table 40

(2) The volume index of the fixed base year 2000 = 100, was calculated fixing the value of year 2000 to 100 and multiplying the successive indices, base previous year index found in column 1.

(4) It is calculated by linking the index of a year to the immediately previous one.

Using this procedure, for year 2008, a volume index of -10.5% (table 40 column (3)) is obtained instead of (-26,6%) as it had been calculated in the first approximation (table 39 column (3)).

This final proposal of the volume index maintains the inverse relationship between changes in prices and volume, while taking also into account the stability in the consumption habits of households.

The previously described exercise for "food and non-alcoholic beverages" was applied similarly for the remaining products.

5.2.2. Using other sources of information

Other sources used to estimate HFCE in current years are the Monthly Retail Trade Surveys, combined with the income of households; the New Motor Vehicle Trade Survey (CVAN87); the incidence studies of consumption of cigarettes and illicit substances; and the supply of goods and services.

5.2.2.1 Monthly Retail Trade Survey (MMCM) and income of households.

The MMCM[88] collects information on sales at major shopping locations used by households. However this information does not only reflect the dynamics of total consumption but also the changes in the places where households shop; households might increase their purchases in supermarkets, either because of the capability of those shops to make greater discounts, or by the variety of payment options allowed. For this reason, it was necessary to combine the variations reported by the MMCM with an indicator that would reflect the general purchasing power of households. The indicator of the purchasing power of households used was the income as reported in household surveys.

[87] For its Spanish acronym

[88] The companies surveyed by the MMCM are those whose annual income were at or above 1.210 million pesos in 1997 and /or employed 20 or more persons and whose principal economic activity corresponded to Retail Trade of goods or new products

Table 41 presents the sixteen national accounts products, for which four groups of the MMCM were used in order to establish the proposal of change in the value of consumption.

Table 41. Identification of the National Accounts products for which indicators from MMCM were used to estimate their change in value

Description CNN	Detail of the MMCM
Soya bean	Food and non-alcoholic beverages
Roses	Other merchandise not previously specified
Carnations	Other merchandise not previously specified
Dahlia; orchids and other cut flowers	Other merchandise not previously specified
Living plants: flower buds, and seeds of flower, fruits and vegetables	Other merchandise not previously specified
Other beverage crops and spices, whether or not processed	Food and non-alcoholic beverages
"Other live animals, raised or captured, n.e.c; other by-products whether edible or not	Food and non-alcoholic beverages
Paper products, paper board and its products	Books, stationery, newspapers and magazines
Fertilizers and pesticides	Other merchandise not previously specified
Paints and varnishes and related products	Articles of ironworks, glasses and paintings
Watches and clocks, and parts thereof	Other merchandise not previously specified
Jewelry and related articles	Other merchandise not previously specified
Music instruments	Other merchandise not previously specified
Sports articles	Other merchandise not previously specified
Games and toys; Mary-go-round swings, shooting galleries and other fairground amusements: n.e.c	Other merchandise not previously specified

Source: DANE, DSCN

The combination of the variations of the MMCM and that of household income was made by averaging (simple arithmetic average). The calculated averages are shown in Table 42. This average enables softening strong changes in demand that can be explained by changes in the places in which households shop, and not necessarily by changes in overall demand.

Table 42. Averages of the changes in value derived from the Monthly Retail Trade Survey (MMCM) and the income of households

2001-2008

Years	Annual growth rates of sales from MMCM				Annual growth rates of Income of Households	Average annual growth rates (IMMCPM + Ihouseholds) /2			
	Food and non-alcoholic beverages	Books, stationery, newspapers and magazines	Hardware items, glasses and paintings	Other non-specified merchandise		Food and non-alcoholic beverages	Books, stationery, newspapers and magazines	Hardware items, glasses and paintings	Other non-specified merchandise
2001	11,8	22,8	15,9	15,8	10,0	10,9	16,4	12,9	12,9
2002	8,4	5,1	11,5	8,3	11,2	9,8	8,2	11,4	9,7
2003	4,0	19,4	12,8	3,9	8,8	6,4	14,1	10,8	6,3

2004	7,8	14,5	23,7	4,5	13,4	10,6	13,9	18,5	8,9
2005	11,5	19,1	20,9	24,2	10,1	10,8	14,6	15,5	17,1
2006	13,0	11,8	28,6	23,5	12,4	12,7	12,1	20,5	17,9
2007	10,1	14,0	19,0	38,0	13,7	11,9	13,9	16,3	25,9
2008	11,3	0,7	3,1	10,8	4,7	8,0	2,7	3,9	7,7

Source: DANE, DSCN
2/ simple average

5.2.2.2 New Motor Vehicle Trade Survey (CVAN).

This survey is actually of a census-type meaning that it collects information on vehicle sales, both nationally produced and imported, made by authorized dealers nationwide (DANE, 1997). In order to project the value of household final consumption expenditure, the changes in the sales of private vehicles and jeeps are taken. The value index calculated for the product "Motor vehicles, for the transport of persons" of the classification of national accounts is presented in Table 43 as follows:

Table 43. Proposed annual growth rates for "Motor vehicles, for the transport of persons (private), according to types of vehicles

2000-2009 Thousand million pesos

Years	Types of vehicles			Annual growth rate
	Private Vehicles	Jeeps	Private Vehicles and jeeps	
2000	821	271	1.093	
2001	1.246	348	1.595	45,9
2002	1.532	387	1.919	20,3
2003	1.509	469	1.978	3,1
2004	2.333	717	3.050	54,2
2005	2.961	823	3.783	24,0
2006	3.985	1.166	5.151	36,2
2007	5.233	1.659	6.891	33,8
2008	3.388	1.456	4.844	-29,7
2009	1.014	1.065	2.079	-57,1

Source: DANE, DSCN

5.2.2.3 Studies on consumption of cigarettes and illicit substances

The incidence studies establish the percentage of persons that consume certain products within the total reference population. This information is used to estimate the evolution of consumption of cigarettes and illicit substances.

The tobacco consumption surveys are the starting point in the calculation procedure, and are based on two benchmarks: in the first place, the 1998 results on the II National Study

on Risk Factors of Chronic Diseases[89], and, secondly, the National Health Survey, conducted in 2007[90].

In order to calculate a volume indicator for cigarette consumption, the number of persons reported in the projections of the 2005 census population was multiplied by the incidence rate. As there are only incidence rates for 1998 and 2007, it was necessary to calculate a trend between the two health surveys and to calculate the number of consumed cigarettes according to the frequency of consumption.

Table 44 shows the process of using the incidence rates of health surveys in the calculation of a volume indicator of cigarette consumption, for the population aged 12 to 17. This same exercise was applied for the group of persons aged 18 to 69.

Table 44. Volume indicator of cigarette consumption by the population aged 12 to 17 1998-2008

Years	Population aged 12 to 17	% of smokers within the population aged 12 to 17	Average cigarettes per day	Cigarettes consumed annually
1998	4.778.414	3,5	4,2	256.385.803
1999	4.845.867	3,4	3,8	228.355.440
2000	4.919.943	3,3	3,4	201.371.141
2001	4.990.456	3,1	3,1	175.027.491
2002	5.058.200	3	2,7	149.481.862
2003	5.121.849	2,9	2,3	124.816.298
2004	5.182.569	2,8	1,9	101.181.598
2005	5.239.008	2,6	1,6	78.661.441
2006	5.285.620	2,5	1,2	57.310.673
2007	5.317.748	2,4	0,8	37.266.778
2008	5.335.865	2,3	0,4	18.730.533

source: DANE, DSCN

Subsequently, a volume indicator was derived from the sum of cigarettes consumed by both age groups. Table 45 shows the calculation of the volume indicator for the total population.

Table 45. Annual growth rate of the volume indicator of consumption of cigarettes 1998-2008

Years	Cigarettes consumed annually by			Annual growth rate
	Population aged 12 to 17	Population aged 18 to 69	Total consumption by population of reference	

[89] The II National Study on Risk Factors of Chronic Diseases was conducted in 1998, by the Ministry of Health, the National Consulting Center and the firm, Specialized Systems of Information.

90 The National Health Survey was conducted in 2007 by the Ministry of Social Protection, the National Science and Technology Agency (Colciencias), the firm Specialized Systems of Information and the Universidad Pontificia Javeriana (Projects for Development Center [Cendes]).

1998	256.385.803	11.779.171.925	12.035.557.728	-
1999	228.355.440	11.870.587.290	12.098.942.730	0,5
2000	201.371.141	11.937.076.801	12.138.447.942	0,3
2001	175.027.491	11.978.947.671	12.153.975.162	0,1
2002	149.481.862	11.997.970.914	12.147.452.776	-0,1
2003	124.816.298	11.992.252.582	12.117.068.880	-0,3
2004	101.181.598	11.958.132.619	12.059.314.217	-0,5
2005	78.661.441	11.891.255.462	11.969.916.904	-0,7
2006	57.310.673	11.799.514.954	11.856.825.627	-0,9
2007	37.266.778	11.668.295.285	11.705.562.063	-1,3
2008	18.730.533	11.498.624.601	11.517.355.134	-1,6

Source: DANE, DSCN

The methodology used for the calculation of illicit substances was similar.

5.2.2.4. Supply of goods and services

It refers to products that, due to their characteristics, are directly related to the sources of supply and from these indicators the evolution of HFCE is calculated. There were two classes of cases:

- **Products in which household consumption equals total supply**. It is the case of the supporting administrative services of pension funds and retirement savings allowances, rental or leasing services involving own or leased property, artistic and promotion services; shows organization, motion picture projection services, library and archive services and gambling and betting services.

- **Products in which the source of supply provides information of the HFCE:** The supply of public utilities is directed specifically to residential and non-residential units, so that the report on sales to residential units is used as an indicator of HFCE of these services.

5.2.2.5. Other sources of information:

Other sources of information were used to calculate the HFCE of specific products such as: the Financial Intermediation Services Indirectly Measured (FISIM), goods for consumption on own account and other services for which the surveys on demand do not include information.

- **Financial Intermediation Services Indirectly Measured (FISIM):** This product corresponds to the services not explicitly charged by financial intermediaries, for the use of resources in financial operations attributable to households as final consumers and that are estimated indirectly. The operations related to those services are: consumption loans, credit cards, deposits and certificates of deposit.[91] Households pay indirectly for those services on the one hand, by receiving a lower

[91] It should be pointed out that in the case of mortgages, households are considered as “entrepreneurs”, owners of dwellings that produce a service on own account to their owners.

interest for their deposits and on the other, by paying a higher interest for their liabilities as compared to what they would actually receive or pay, has the service been charged separately. The detailed methodology of the calculation of the series of FISIM can be found in Chapter 11 of the present document.

- **Goods for consumption on own account:** This indicator is used for three products whose consumption corresponds exclusively to consumption on own account; this is the case of parchment coffee, paddy rice and fuel wood.

- **Other goods and services**: In the cases where the surveys on demand do not include information, the income of households was used as an indicator of the evolution of their value. Services for which such estimation is used are the following: Water and rail transport services, commissions and other intermediary financial services, real estate services, legal, accounting, advertising, researching, photographic services and services provided by associations.

Annex 9 describes the sources of information used for the calculation of the changes in value of HFCE, according to National Accounts products.

5.2.3. Evolution of the prices of Household Final Consumption Expenditure (HFCE)

The previous section described the methodology used to calculate HFCE at current prices[92]. In order to obtain the value of HFCE at constant prices, a proposal of the variations in prices by product should be made.

The changes in prices by product are mainly based on the Consumer Price Index (CPI), with the exception of products such as FISIM, supporting financial intermediation services of insurance, pension funds and retirement savings allowances, general insurance, life insurance and education services, for which it was necessary to use a price index calculated from supply sources (see Section 5.2.2.4). Other excluded products were illicit substances (opium poppy, marijuana, cocaine and heroin) for which the total CPI was used.

For products whose price indicator was based on the CPI, a correlative was defined between the product classification of the CPI and that of national accounts. In the cases in which a national accounts product corresponded to various products of the CPI, the implicit weights of the 2006-2007 National Income and Expenditure Survey were used. Table 46 shows, as an example, the national accounts product named "paper and paperboard products."

Table 46. Weights of the Consumer Price Index (CPI) for "paper and paperboard products"

National Accounts Product	Code and CPI Product	Product of ENIG	Consumption value in the ENIG (thousand million pesos)	Weight CPI (%)

[92] Except for consumption of cigarettes and illicit substances, for which the volume variation are calculated.

		2730100	Kitchen paper	Aluminum foil , waxed paper, aluminum moulds, vinilpel, filter papers.	85	10,0
				Kitchen paper rolls	96	
				Paper sheets (Legal, Letter, tabloid, A3 A4, B5, A5 and Folio, graph paper, tracing paper, carbon copy paper), paperboard	59	
250003	Paper and paperboard products	5220100	Other school expenses	Other stationery items: folders, envelopes (letter or Manila), linings, labels	30	8,0
				Reams of paper (letter or legal A4)	52	
				Toilet paper	1.500	
		9210200	personal hygiene	Disposable Towels: hand tissues, disposable kitchen paper, handkerchiefs, humid tissues	56	82,0

Source: DANE, DSCN

Annex 10 presents the price indicator used for each product.

5.2.4. Classifications of household final consumption expenditure.

The series of HFCE are established according to three classifications: by products, by purposes and according to the durability of goods and services.

- **By products**. It is the most detailed classification and corresponds to the level at which the synthesis of national accounts is carried out. The products are defined according to their nature and manufacturing process, based on the CPC. Out of the 369 products defined in the national accounts product classification, 195 present household final consumption expenditure as use.

- **By purpose[93].** This is an international classification that groups consumption according to the purpose fulfilled by each product. Currently, the following twelve categories are considered:

01 Food and non-alcoholic beverages
02 Alcoholic beverages, tobacco and narcotics
03 Clothing and footwear
04 Housing, water, electricity, gas and other fuels
05 Furnishings, household equipment and current household maintenance
06 Healthcare
07 Transport
08 Communication
09 Recreation and culture
10 Education

[93] Based on COICOP: Classification of Individual Consumption by Purpose,

11 Restaurants and hotels
12 Miscellaneous goods and services

The number of divisions defined by this international classification has changed in accordance with the relative importance of the corresponding groups of products within total consumption. Transport, communications and meals taken outside of the home, that in past decades were not a main division of consumption, have been reclassified to visualize their importance.

- **By durability.** Within this classification, HFCE is broken down into four groups: durable, non-durable, semi-durable and services.

The starting point to obtain HFCE by purposes and durability is the national accounts product classification. Each product may correspond to one or more purposes and degrees of durability. The weights observed in the ENIG are also used in this case to allocate the product among purposes and degrees of durability[94]. Annex 11 presents the weights by purpose and durability.

Table 47 illustrates the process by which the product 200400 "Natural Cotton and natural fiber fabrics, other than cotton" is distributed among different purposes.

Table 47. Weights assigned to the product "Natural textile fibers; yarn and thread; woven and tufted textile fabrics ", of the National accounts classification in COICOP, based on the National Income and Expenditure Survey (ENIG)

National Accounts Product		ENIG in detail	ENIG Weights by product (%)	COICOP classification
200400	Cotton and natural fiber fabrics, other than cotton	Fabrics for the manufacturing of clothing for men, women, boys, girls and babies	36	03 Clothing and footwear
		Fabrics to make beddings, table cloths, curtains and linings of furniture	23	05 Furnishings, household equipment and routine household maintenance
		Band-Aids, gauze pads/roller gauze and tape, anti-bacterial wipes	10	06 Health products
		Cotton, body sponges and cotton swabs	31	12 Miscellaneous Goods and services

Source: DANE, DSCN

According to this methodology, 36% of the value of the product is allocated to the purpose 03 "Clothing and footwear", 23% to the purpose 05 "Furnishings, household equipment and routine household maintenance, 10% to the purpose 06 "Health" and the remaining 31% to the purpose 12 "Miscellaneous goods and services"[95].

[94] To make this distribution the classification used for backcasting the series of national accounts were mostly used, see Annex
[95] Annex 11 presents the weights of the ENIG used for each of the products of national accounts

A similar process is carried out in order to classify the goods and the services according to their durability. Following the previous example, the weights of the components according to the ENIG are applied to the total value of the national accounts product. Table 48 shows the weights of ENIG used for the product “Cotton and natural fibers fabrics”.

Table 48. Shares applied to "Cotton and natural fibers fabrics ", using the National Income and Expenditure Survey (ENIG) for the classification by durability

National Accounts Products	Detailed ENIG classification	Weight by product (%)	Durability
200400 Cotton and natural fibers fabrics, other than cotton	Fabrics for the manufacturing of clothing for men, women, boys, girls and babies.	59	Semi-durable
	Fabrics to make beddings, table cloths, curtains and linings of furniture		Semi-durable
	Band-Aids, gauze pads/roller gauze and tape, anti-bacterial wipes	41	Non-durable
	Cotton, body sponges and cotton swabs		Non-durable

Source: DANE, DSCN

5.2.5. Results of the series of HFCE

Table 49 shows the growth rates of HFCE for the 2000-2008 period, obtained according to the methodology described in Section 5.2. These results include the adjustments performed in the stage of synthesis of the goods and services transactions described in Chapter 6.

Table 49. Growth Rates of HFCE at previous year´s constant prices according to COICOP categories
2001-2008

Concepts	2001	2002	2003	2004	2005	2006	2007	2008
Total	1,8	1,8	3,1	3,9	4,0	6,6	6,9	3,4
Food and non-alcoholic beverages	0,3	1,5	0,9	1,9	2,2	3,5	3,8	2,3
Alcoholic beverages, tobacco and narcotics	-2,0	-3,1	-2,2	-0,3	-0,3	-2,9	1,0	-1,4
Clothing and footwear	1,9	-0,2	2,2	3,3	4,5	6,6	7,2	1,0
Housing, water, electricity, gas and other fuels	2,2	2,3	2,9	3,2	3,4	4,0	3,2	1,4
Furnishings, household equipment and routine household maintenance	3,3	3,0	3,9	3,9	1,4	7,3	7,0	3,0
Health	3,2	1,4	4,4	1,4	2,8	4,9	4,5	4,6
Transport	4,6	3,9	3,2	5,9	7,5	7,9	13,8	2,9
Communication	6,5	4,7	5,9	6,8	9,5	30,9	21,4	11,0
Recreation and culture	3,1	3,7	8,5	7,3	11,9	11,5	7,4	8,0
Education	0,4	-0,2	-0,1	-0,1	1,2	2,5	4,1	1,3
Restaurants and Hotels	1,1	0,5	6,0	7,4	4,3	7,2	6,3	5,2
Miscellaneous goods and services	1,4	3,2	4,2	5,4	3,5	7,5	9,4	5,0

Source: DANE, DSCN

Food and non-alcoholic beverages, in general, are closely related to the growth rate of the population. The group of alcoholic beverages, tobacco and illicit substances tends to decrease, especially in years when restrictions or barriers to smoking and alcohol

consumption are implemented. Groups of consumption such as transport, communications and recreation show significant growth associated with the years of greatest economic dynamics. Finally, the groups of restaurants and hotels, and miscellaneous goods and services have grown steadily, mainly from year 2003 as shown in Table 49.

5.2.6. Adjustment for purchases of residents abroad and non-residents in the national economic territory

The HFCE calculated in accordance with the above procedure, refers to the HFCE in the national economic territory. To calculate HFCE corresponding to residents, a global adjustment is made using the direct purchases by non-resident households in the economic territory (+) and final consumption of households residing abroad (-). Table 50 shows the results of this adjustment.

Table 50.Adjustment for purchases of residents abroad and non-residents in the national territory at current prices

2000-2008

Thousand million pesos

COICOP Description	2000	2001	2002	2003	2004	2005	2006	2007	2008
01 Food and non-alcoholic beverages	28.248	31.153	34.141	36.479	39.292	42.107	45.919	51.227	58.882
02 Alcoholic beverages, tobacco and narcotics	5.366	5.969	6.367	6.825	7.397	7.797	8.417	9.717	9.904
03 Clothing and footwear	10.817	11.780	12.032	12.785	14.262	15.505	17.063	18.787	19.176
04 Housing, water, electricity, gas and other fuels	25.867	27.997	29.904	32.740	35.696	38.408	41.801	45.203	48.505
05 Furnishings, household equipment and routine household maintenance	7.383	7.991	8.402	9.166	9.905	10.328	11.600	12.501	13.071
06 Health	4.869	5.393	5.810	6.513	6.973	7.516	8.502	9.279	10.229
07 Transport	11.723	13.572	14.983	17.191	19.949	22.967	26.399	31.413	34.003
08 Communication	4.787	5.723	6.361	7.383	8.207	9.222	11.543	13.393	14.610
09 Recreation and culture	6.902	7.395	8.147	9.008	9.861	11.183	12.536	13.405	14.762
10 Education	8.126	9.003	9.518	9.899	10.471	11.096	11.946	13.108	14.045
11 Restaurants and hotels	14.814	15.987	17.267	19.267	22.001	24.270	27.500	31.455	35.395
12 Miscellaneous goods and services	15.233	16.730	17.845	19.534	21.736	23.349	26.053	29.200	32.339
Total HFCE in the economic territory	**144.135**	**158.693**	**170.777**	**186.790**	**205.750**	**223.748**	**249.279**	**278.688**	**304.921**
Adjustment for residents´ purchases abroad and non-residents in the national territory, that corresponds to the difference between:	65	-126	281	463	119	-229	-537	-288	-218
Imports: consumption of residents abroad	2.357	2.831	2.872	3.228	3.078	2.773	3.304	3.338	3.577
Exports: non-residents' purchases within the national territory	2.292	2.957	2.591	2.765	2.959	3.002	3.841	3.626	3.795
Total HFCE residents	**144.200**	**158.567**	**171.058**	**187.253**	**205.869**	**223.519**	**248.742**	**278.400**	**304.703**

Source: DANE, DSCN

In the case of Colombia, the difference between the two measurements (HFCE of residents and non-residents in the economic territory and HFCE of resident households) is not significant (around 1 ‰ in 2005), lower than the HFCE estimation error. However, it can affect specific items such as accommodation services or restaurants. This adjustment is not considered at the level of products of National Accounts, and therefore the HFCE by products has been estimated as if it represented the final consumption expenditure of resident households.

5.3. EXPORTS AND IMPORTS OF GOODS AND SERVICES

Exports of goods and services consist of operations (sales, barters, donations and gifts) by which residents provide goods or services to non-residents.

Imports of goods and services are operations (acquisitions, barters, donations and gifts) by which non-residents provide goods and services to residents.

5.3.1. General Method

The imports and exports of goods and services are first calculated at current prices, using the six-digit level of the national accounts classification. Then, imports and exports are deflated to obtain the accounts at previous year´s constant prices. Finally, the 2005 value at 2005 prices is multiplied by the successive volume indices obtained previously in order to compile the corresponding values at 2005 constant prices by chaining. In imports, the CIF-FOB adjustment is compiled in order to transform CIF values of merchandise at the detailed level into a FOB valuation at the aggregated level, adjusting for the value of insurance and freight services between the port of departure of the exporting economy and the port of arrival in Colombian territory included in the CIF value, and differentiating them between services provided by residents and those provided by non-residents, which have a different impact on the balances of the corresponding products.

The same method applied to calculate imports and exports of goods and services for the base year is applied for the calculation at current years.

5.3.2. Exports and imports of goods

- **Valuation**. According to SNA 1993, the global value of imports and exports of goods must be valued in a uniform manner (at the exporter's customs frontier), that is, using a FOB valuation. This value includes the costs of transport and insurance until reaching the border of the exporting country but excludes all the expenses incurred from that point on.

  The use of a FOB valuation for imports of goods implies that globally, the costs of freight and insurance provided beyond the border of the exporting country are recorded as imports of services when the services are provided by non-residents; by the same token, services provided by residents are considered as resident to resident transactions.

  Nevertheless, in commodity flow balances of products, imports of goods are valued CIF (a value that once import duties are added, is equivalent to the basic price for imports). This valuation requires an adjustment in order to transform CIF valuation at the detailed level of products into a global FOB valuation; this is the role of the "CIF/FOB adjustment". (See Section 5.3.5 for further description of the "CIF/FOB adjustment").

- **Time of recording.** Imports and exports of goods are recorded at the moment of the change of ownership of the goods from a resident to a non-resident unit (exports) or vice versa (imports). With some exceptions, this principle determines the coverage of international merchandise trade.

- **Calculation method**. According to the method and data sources used to calculate exports and imports of goods for current years, the basic breakdown is between recorded transactions, un-recorded transactions, and net direct purchases of non-residents in the country and of residents abroad.

  – **Recorded Merchandise Trade:** Recorded imports and exports include all merchandise that crosses the border with complete customs documentation. This information is elaborated from DANE´s foreign trade statistics office, based on basic data generated by the National Tax and Customs Bureau (DIAN[96]).

  In the customs registry, the information is processed using the customs classification which is harmonized with the national accounts product classification, through the correspondence between the customs subheading classification (ten-digit) and the (six-digit) national accounts product classification. The ten-digit customs classification includes 19.139 positions that are harmonized with the six-digit national accounts product classification that comprises 369 products. Table 51 shows an example of the correspondence between the national accounts product: "green coffee" (140102), and its equivalence in the customs classification. Using this correspondence, exports and imports are aggregated at the six-digit level of the national accounts product classification.

Table 51. Correspondence between the customs classification and the national accounts product classification

National accounts codes	Description	Customs Subheading	Customs Description
140102	Green coffee	0901110000	Coffee not roasted, non-decaffeinated.
		0901111000	Coffee not roasted, non-decaffeinated for sowing.
		0901119000	Other coffees not roasted decaffeinated.
		0901120000	Coffee, not roasted, decaffeinated.

Source: DANE, DSCN.

  – **Unrecorded Merchandise Trade.** Exports and imports of unrecorded trade include the transactions related to operations within free trade zones, the special foreign trade operations (OPEC) recorded by the Balance of Payment, and the illegal operations related to narcotic substances and to smuggling.

    ➢ **Free Trade Zones**. They are geographically delineated areas of the country, created for a specific function, characterized by specific taxation and customs regulations[97].

    The foreign trade corresponding to free trade zones is calculated using data derived from administrative records of the free zones management as well as from the Annual Manufacturing Survey (EAM). The databases of free trade zones used to calculate imports

[96] For its Spanish acronym
[97] Law 1004 of year 2005

and exports comprise the daily movements of merchandise to and from the rest of the world corresponding to businesses located in these zones.

There are three types of users of the free trade zones: Manufacturers of goods, general services providers and commercial services providers. There is no direct information available for users of general services and commercial services. Their operations are included within the records of the corresponding activities and are compiled mainly from economic surveys that include in theory all transactions of resident operators, wherever they operate. Nevertheless, it is not feasible to isolate the information concerning entities located in free trade zones in order to check its consistency.

In the case of manufacturers of goods, their exports to the rest of the world are calculated on the basis of the information regarding the movements of merchandise to the rest of the world of those users, an information which is available using the customs tariff code and transformed into the 2005 national accounts product classification.

The imports of raw materials, materials and packaging from the rest of the world are calculated as follows: for businesses included in the EAM, by applying to the value of each raw material the share of imported products derived from the sample based on the EAM; for others, using the database from the free trade zones themselves.

- **Foreign trade of goods calculated from the special operations of the Balance of Payments**. The OPEC include: Bunkers and stores acquired by vessels in ports, the imported/exported goods for repair, the imported/exported goods to be processed and the re-exports (imported goods to be re-exported, without transformation). The above information is directly taken from the quarterly BoP data, by multiplying the values in US$) by the quarterly exchange rate and adding the four quarters of the year. Each of those components are calculated as follows:

Goods for processing*[98]*. For the calculation of exports of goods for processing, the BoP takes the internal code from DANE's foreign trade statistics that identifies exports of goods for that purpose, deducting the transactions that take place in free trade zones since they are considered as operations between residents, and records the value as special BoP operations. Within the value of imports, DIAN only reports the value of processing. The BoP deducts the value traded in free trade zones and adds an estimate of the value of the goods originally traded, calculated as an average ratio relating the value of the goods that are exported for processing and the value of the goods once processed.

[98] In this case it should be noted that the latest international recommendations regarding National Accounts (SNA 2008), Balance of Payments (BPM6) and Statistics on International Trade in Services (MSITS 2010) recommending treating such cases as export of services, and not as foreign trade of merchandise, by strictly applying the concept of change of ownership, are not being implemented.

***Repair of goods*.** In contrast with the treatment of goods for processing, only the value of the repair services is recorded (not the gross value of the goods). For this purpose, the BoP considers the modality codes by DIAN referring to the re-imports of repaired merchandise and re-exports of merchandise for repair and from this value, the share of the value of repair service is estimated, that is the one that is finally recorded. In both cases, the operations that take place in free trade zones are deducted and the net value is recorded as special BoP operations.

- **Exports and imports of goods acquired as bunkers and stores.** These transactions are included as imports or exports even though they do not cross borders (a resident to non-resident transaction). These transactions must be included in the exports or imports of a country if there is a change of ownership, as is the case of goods acquired in port (abroad or in the country) by means of transport, that is to say, fuel, food, equipment and other supplies. The corresponding data are obtained from the BoP, and from direct quarterly surveys to carriers, in which the consumption of fuel and other provisioning expenses abroad is reported. In the case of exports, a direct survey is conducted with the fuel sales centers.

Re-exports. Re-exported goods refer mainly to goods that have been previously imported, for instance, equipment imported by the oil enterprises for the development of their activities in the country or aircrafts and their parts that remain in the country for more than a year and are later exported, after concluding their use in the country.

- **Smuggling**. Smuggling includes an estimate of the quantity of goods entering the country or leaving it illegally without any type of record. In a first stage, the value of smuggling is calculated as the difference between the value of exports towards Colombia recorded by Colombia´s main commercial partners and the imports from the same partner countries as recorded in Colombia´s official statistics (mirror statistics). The values calculated using this method are included in the commodity flow balances. Then, based on different additional sources and the consistency of the results, a decision is made whether the data resulting from this estimation are directly included or further adjusted.

- **Transactions related to trade on narcotic substances**. The production of narcotic substances is treated in national accounts as occurring in a virtual territory (an enclave) in which all the production processes and the transformation of illicit products are carried out. All transactions of Colombia with this enclave are recorded as if occurring with the rest of the world, that is as exports (inputs for the production processes, such as fuel, concrete, plastic and other products) and imports (marijuana, cocaine and heroin for household final consumption expenditure in the economic territory). The estimation of the transactions related to the enclave is an additional research published separately, (See: “Enclave; Cultivos ilícitos. Fases agrícola e industrial. Base 2005”. Serie 2000-2010 pr. DANE octubre 2011) / “Enclave. Illicit crops; agricultural and industrial phases. 2005 base year www.dane.gov.co

- **Structure of exports and imports**. Tables 52 and 53 show an example of exports and imports of the product "Fertilizers and pesticides" (280105) broken down into: Recorded exports, non-recorded exports and its components. All the national accounts products are presented with a similar breakdown.

Table 52. Components of exports for product 280105 "fertilizers and pesticides"
2008 Thousand million pesos

National Accounts Code	Description	Total exports FOB price (1) (1=2+3)	Recorded Exports FOB (2)	Non-recorded Exports FOB (3)	BoP (OPEC)	Smuggling	Illicit crops	Free Trade Zones
				(3=4+5+6+7)	(4)	(5)	(6)	(7)
280105	Fertilizers and pesticides	850	557	293	1	0	247	45

Source: DANE, DSCN.

Table 53. Components of imports for product 280105 "fertilizers and pesticides"
2008 **Thousand million pesos**

National Accounts Code	Description	Total imports CIF price (1) (1=2+3)	Recorded Imports CIF (2)	Non-recorded Imports CIF (3)	BoP (OPEC)	Smuggling	Illicit crops	Free Trade Zones
				(3=4+5+6+7)	(4)	(5)	(6)	(7)
280105	Fertilizers and pesticides	2.437	2.068	369	0	340	0	29

Source: DANE, DSCN.

- **Direct Purchases**. The goods and services purchased by residents when traveling abroad for business and personal reasons are included in imports, while the goods and services purchased by non-residents when visiting the country for businesses or personal reasons are included in exports; in both cases, the stay in the country or abroad should be for less than a year. The goods acquired by embassies and national representations abroad are also included under this heading. Direct purchases are derived from the BoP items "travel" and "government services n.i.e"; the breakdown between goods and services is based on the results of the 2000 International Travelers Survey[99].

Tables 54 and 55 present the values of the purchases of goods and of services for both imports and exports.

Table 54. Direct purchases of goods, import and exports
2008 **Thousand million pesos**

National Accounts Codes	Items	Value
620100	Direct purchases abroad by residents - Goods	1.369
630100	Direct purchases in the domestic market by non-residents –	2.146

[99] This procedure is being revised and will be amended in the next revision of national accounts as this value is assigned exclusively to HFCE (resident or non-resident) whereas intermediate consumption of industries are also included.

	Goods

Source: Central Bank; Calculations: DANE, DSCN.

Table 55. Direct purchases of services, import and exports
2008 **Thousand million pesos**

National Accounts Codes	Items	Value
620200	Direct purchases abroad by residents - Services	2.208
630200	Direct purchases in the domestic market by non-residents – Services	1.649

Source: Central Bank; Calculations: DANE, DSCN.

- **Presentation of results**. Tables 56 and 57 present the final data referring to international trade in goods for year 2008 broken down into recorded, non-recorded transactions and direct purchases.

Table 56. Total exports of goods
2008 **Thousand million pesos**

Total exports FOB value (1) (1=2+3+4)	Direct Purchases of goods (2)	Recorded Exports FOB (3)[100]	Non-recorded Exports FOB (4) (4=5+6+7+8)	BoP[101] (5)	Smuggling (6)	Illicit crops (7)	Free Trade zones (8)
80.277	2.146	74.813	3.318	882	96	736	1.604

Source: DANE, DSCN.

Table 57. Total Imports of goods
2008 **Thousand million pesos**

Total Imports CIF Value (1) (1=2+3+4)	Direct Purchases of goods (2)	Recorded Imports CIF (3)[102]	Non-recorded Imports CIF (4) (4=5+6+7+8)	BoP (5)[103]	Smuggling (6)	Illicit crops (7)	Free Trade Zones (8)
87.704	1.369	77.379	8.956	629	6.722	387	1.218

Source: DANE, DSCN.

5.3.3. Exports and imports of services

- **Description**.

Exports of services include all the services provided by residents to non-residents.

Imports of services include all the services provided by non-residents to residents.

- Following the Balance of Payments classification, services comprise transportation services; travel; construction services; computer and information services; communication services; insurance services; financial services; royalties and license fees; other business services; personal, cultural and recreational services, and government services n.i.e.. Additionally services

[100] Recorded exports are calculated from information provided by DIAN
[101] The Balance of Payments column includes goods for processing, repairs and re-exports as well as fuel and bunker (except food)
[102] Recorded imports are calculated from information provided by DIAN
[103] The Balance of Payments column includes goods for processing, repairs and re-imports as well as fuel and bunker (except food)

purchased by residents when traveling abroad for business and personal reasons are included in imports, and services purchased by non-residents when visiting the country for businesses or personal reasons are included in exports; in both cases, the stay in the country or abroad should be for less than a year. The services acquired by embassies and national representations abroad are also included under this heading. Direct purchases are derived from the BoP items "travel" and "government services n.i.e"; the breakdown between goods and services is based on the results of the 2000 International Travelers Survey[104].

As in the case of goods, the method applied to calculate imports and exports of services in current years is the same as the one used for the 2005 base year.

- **Valuation**. Exports and imports of services must be valued at the actual price agreed upon by the transactors involved in the transaction. In the case of insurance, the value of the service corresponds to the service charge (method consistent with the valuation of the services provided by insurance corporations in National Accounts) and not to total gross premium (the BoP method).

- **Coverage.** Exports and imports of services refer to those services that are originated in a production process; the payments for compensation of employees by residents to non-residents or non-residents to residents are excluded as they are considered in national accounts as international flows of primary income. The same occurs for the flows of property income (interests and dividends) between residents and non-residents that are excluded from the foreign trade in services.

The transactions of foreign trade of services include:

  - **Transportation**. Transportation includes the air, water and road transport services provided by residents to non-residents (and vice-versa). It covers the transportation of passengers and freight and the complementary and auxiliary services provided. In the case of passenger transportation,, the data correspond to the income from the purchase and sale of tickets, extra charges for excess luggage and other services provided by carriers; in the case of freight the data correspond to the income received for the transportation of merchandise beyond the border; whereas auxiliary services include the rights for the use of ports, airports, storage, loading and unloading services, rental of aircrafts with crew, and commissions for sale of tickets on behalf of non-residents carriers.

  - **Insurance**. This group includes insurance services on exported and imported merchandise, life and non-life insurance policies taken directly from resident agents abroad and vice versa; and also reinsurance services between resident and non-resident insurance corporations. As it was mentioned before, it is measured by the value of the service charge and not by the gross premium.

  - **Royalties and license fees**. They correspond to the current payments associated with the use of intangible assets and property rights, such as,

[104] This procedure is being revised and will be amended in the next revision of national accounts as this value is assigned exclusively to HFCE (resident or non-resident) whereas it also includes intermediate consumption of industries.

patents, trademarks, copyrights, industrial processes, franchises. They are included in imports and exports of business services.

– **IT services**. They are related to the computer processing of information by residents for non-residents and vice-versa. It includes the services provided for processing information; technical support advice (hardware); software application support; maintenance and repair of computers and peripheral equipment.

– **Telecommunication and postal services**. They correspond to the transmission of sound, images, e-mail, fax, telephone, telex, video chat and the collection, transport and delivery of mail, magazines, newspapers and other publications.

– **Other services**. This group includes financial services, other business and personal services. The financial services refer to the commissions and fees paid to financial entities. Other business services include the leasing of machinery and equipment, ships, airplanes and other modes of transport without crew, advertising services, research and development services, architectonic, engineering services, etc. Personal services include the recreational, cultural, services, fees to artists, actors, directors who participate in cinematographic, theater, musical productions, radio and television programs, sporting events, etc., and the transmission rights of movies.

- **Method followed in the calculation of foreign trade in services**. The imports and exports of services are calculated from the information of BOP published by the Central Bank. The estimation of FISIM for imports and exports[105] is added to this calculation.

The BoP information is available on a quarterly basis, in US$, broken down by type of service. Its estimates are based on two main sources of information:

– Surveys to businesses or entities that carry out resident/nonresident transactions such as national and foreign airlines, shipping agencies, the Administrative Department of Civil Aeronautics, the National Superintendency of Ports, telecommunication enterprises, mail and courier enterprises, among others.

– Information obtained through supervision entities, such as the consolidated financial statements of insurance corporations from which the reinsurance operations with the rest of the world are estimated.

In order to compile the national accounts, the information provided by the BoP at quarterly level in US$ is converted into the national currency, using quarterly averaged exchange rates. There is full consistency between the BoP and the national accounts, except for some products where the available information is processed differently:

- National Accounts take information on energy and gas services from the statistics of foreign trade of goods, whereas BOP does

[105] Chapter 11 explains the methodology used to calculate the imports and exports of FISIM.

not register the value of foreign trade for this concept; this information is shown in Table 58.

Table 58. Correspondence between the customs tariff and the national accounts product classification
Electric power
2008

Thousand million pesos

National Accounts Code	Products/Services	Customs tariff Subheading	Customs Description	Tariff	Value
380001	Generation of electric power	2716000000	Electric power		77

Source: DANE, DSCN

- Regarding the special operations of goods acquired by vessels in ports of BOP (bunkers and stores), national accounts classify food and storage as catering services of food and beverages, whereas fuels are included in goods; the transformation of BoP data into national accounts data is shown on Table 59.

Table 59. Goods acquired by vessels in ports, according to BoP - Special Foreign Exchange Operations (OPEC)
2008

Types of godos	National accounts codes	Exports		Imports		
		Million dollars	Thousand million pesos	Million dollars	Thousand million pesos	
Bunker and stores by vessels in ports		267	514	282	549	
Food and beverage serving services	450201-02	10	20		12	23
Gasolines and other fuels	270201	257	494		270	526

Source: DANE, DSCN

- The direct purchases of services abroad by residents (imports), and the direct purchases of services by non-residents in the Colombian economic territory (exports).

- The CIF/FOB adjustment is carried out on transport and insurance and corresponds to freight transport and insurance services between the port of departure abroad and the port of entry to the economic territory and included in the CIF value of merchandise. The explanation of this adjustment can be found in Section 5.3.5.

The methodology used to convert BoP data to national accounts is shown below.

Table 60 illustrates how the BoP services classification is correlated with the National Accounts product classification. In some cases, there is a direct correspondence between the BoP classification and the national accounts six-digit product code; in others, the BoP classification corresponds to more than one national accounts code and the methodology used is explained in the following paragraphs.

Table 60. Correspondence between the BOP and National Accounts regarding foreign trade in services
2008

Thousand million pesos

National Accounts Codes	Balance of Payments of services		
	Concepts	Exports	Imports
	Transport		
	1,1 Water Transport		
470100	1.1.1 Passenger	0	0
470100	1.1.2 Freight	161	0
*	1.1.3 Other water transport	302	154
	1.2 Air Transport		
480100	1.2.1 Passenger	1.288	1.158
480200	1.2.2 Freight	273	0
*	1.2.3 Other air transport	219	469
	1.3 Other transport		
460101	1.3.1 Passenger	0	0
460201	1.3.2 Freight	186	0
490103	1.3.3 Other	0	0
**	**2. Travel**	**3.639**	**3.423**
	3. Communication		
500201	3.1 Telecommunication	477	395
500100	3.2 Postal and mail	12	13
530104	**4. Construction**	**0**	**15**
	5. Insurance		
510201	5.1 Reinsurance	0	700
510201	5.2 Freight	0	151
510201	5.3 Other	0	6
510102	6. **Financial Services**	140	279
	7. IT and information services		
530102	7.1 IT	74	181
590006	7.2 Information	18	56
	8. Royalties and license fees [a]/	**59**	**523**
	9. Other business services		
530206	9.1 Merchanting and other trade-related services	307	408
530101	9.2 Operational leasing	2	45
	9.3 Miscellaneous professional and technical services	-	-
530104	9.3.1 Technical Assistance	603	1.589
530201	9.3.2 Advertising	57	55
530104	9.3.3 Other	85	227
	10. Personal, cultural and recreational services		
	10.1 Audio-visual and related services	46	75
590005	10.2 Other personal, cultural and recreational services	40	6
	Government services n.i.e [b/]	156	154

Source: Central Bank, (BoP) Calculations: DANE, DSCN

[a/] They are broken down into different national accounts products; This methodology is explained in more detail further in this chapter.

[b/] They are allocated to direct purchases of non-residents in the national territory (exports) and of residents abroad (imports) (see Tables 53 and 54).

The breakdown for the items indicated with an * in table 60 is presented in detail below.

- **Water and Air Transport**
  - **Other water and air transport services**. This category includes the rental of transport equipment (boats and aircraft) with crew (or operational

leasing), for limited periods of time, and auxiliary transport services (loading, unloading, rights of terminal facilities, towing, etc.) that are provided at ports and airports. These services are classified in BOP as "other water and air transport services". The total value derives from BoP and is broken down according to the concepts contained in the item "other" of the BOP provided by the Central Bank; its relationship to the national accounts product classification is shown in Table 61.

Table 61. Foreign trade of other shipping and air transport services, by type of services of the BoP
2008

Types of Services	National accounts Codes	Exports		Imports	
		Million dollars	Thousand million pesos	Million dollars	Thousand million pesos
1.1.3. Total other water transport		155	302	79	154
Rental of ships with crew	470100	0	0	62	121
Rights paid at terminal facilities	490104	83	163	9	18
Commissions	490104	42	81	1	2
Routine repairs [a]	340301	30	58	1	2
Other related services	530206	0	0	6	11
1.2.3. Total other air transport		112	219	237	469
Rental of aircraft with crew	480100	7	14	6	12
Aeronautical Services	490105	46	89	90	179
Commissions	490201	27	53	5	9
Routine Repairs [a]	340301	17	33	108	213
Other related services	530206	15	30	28	56

Source: Central Bank, (BoP)
[a/] This item is included under services related to the manufacturing of transport equipment at the two-digit product level corresponding to "Transport equipment".

- **Royalties and license fees**. This category includes the exhibition services of movies, and royalties and franchises. National accounts take the detailed information from BoP as shown in Table 62.

Table 62. Foreign trade of royalties and license fees, by types of BoP services
2008

Types of services	National Accounts Codes	Exports		Imports	
		Million dollars	Thousand million pesos	Million dollars	Thousand million pesos
8. Royalties and license fees		30	59	263	523
8.1 Exhibition of films	590002	0	0	8	15
8.2 Research and Development	530103	30	59	255	508

Source: Central Bank, (BoP)

- **Audio-visual and related-services**. This category includes the services and rights related to the production of cinematographic films or videotapes, radio and television programs (live or recorded) and musical recordings. It also includes the access to subscription television (decoded) and other services related to the payment of fees to foreign artists in the country. The value registered by the BoP for this concept is taken and is broken down according to the national accounts product classification as shown in Table 63 below.

Table 63. Foreign trade of audio-visual and related-services, by types of BoP services
2008

Types of Services	National accounts Codes	Exports		Imports	
		Million dollars	Thousand million pesos	Million dollars	Thousand million pesos
10.1 Audio-visual and related-services		24	46	38	75
10.1.1. Production for TV, radio and by written means and transmission rights of sport, cultural events, etc.	590004	22	42	25	50
10.1.2. Access to TV by subscription (decoded)	500204	0	0	2	3
10.1.3. Artistic Services and of promotion and organization of events	590005	2	4	11	22

Source: Central Bank, (BoP)

Presentation of results

- **Presentation of results**. Tables 64 and 65 show the final data corresponding to export and import of services. The reported data are obtained from adding the BoP values that are in Table 60, plus the items of services incorporated by national accounts such as FISIM, electric power and food and supplies reported in the OPEC of the BoP.

Table 64. Total export of services
2008

Thousand million pesos

Total exports (1) (1=2+3+4)	Direct Purchases of services (2)	BoP Exports (3)	Other exports (4) (4=5+6)	BoP OPEC (5)	FISIM (6)
6.079	1.649	4.335	95 [a]	20	75

Source: DANE – DSCN

a It includes special operations, reported as provision of food and beverages plus the value of the FISIM

The data on BoP Exports in column 3 are derived in the following way:

+	Total exports of services according to BoP	8.144
-	Travel (exports of goods and of services)	3.639
-	Government services (included in direct purchases)	156
+	Electric energy exported	77
-	Product 340301[106]	91
=	**Exports of services calculated from BoP**	**4.335**

Table 65. Total Imports of services
2008

Thousand million pesos

Total Imports of services (1) (1=2+3+4)	Direct Purchases of services	BoP Imports (3)	Other imports (4) (4=5+6)	BoP OPEC (5)	-	FISIM (6)

[106] It corresponds to the services related to the manufacture of transport equipment, included in exports of goods

		(2)				
	9.179	2.208	6.103a	1.868	23	1.845

Source: DANE, DSCN

The data on BoP Imports in column 3 are derived in the following way:

+	Total imports of services according to BoP (Table 60)	10.082
-	Travel (imports of goods and of services)	3.423
-	Government services (included in direct purchases)	154
-	Transport	151
+	Electric energy imported	4
-	Product 340301[107]	255
=	**Imports of services calculated from BoP**	**6.103**

5.3.4 Total foreign trade of goods and services.

Tables 66 and 67 present the total value of imports and exports of goods and services, for year 2008, and all its aggregations.

[107] It corresponds to the services related to the manufacture of transport equipment, included in exports of goods

Table 66. Total exports of goods and services

2008

Thousand million pesos

Concepts	Total exports (1) (1=2+3+4)	Direct Purchases (2)	Recorded Exports (3)	Non-recorded Exports (4) (4=5+6+7+8+9)	BoP OPEC (5)	Smuggling (6)	Illicit crops (7)	Free Trade zones (8)	FISIM (9)
Total	86.354	3.795	79.148	3.411	902	96	736	1.602	75
Goods	80.275	2.146	74.813	3.316	882	96	736	1.602	-
Services	6.079	1.649	4.335	95	20	-	-	-	75

Source: DANE, DSCN

Table 67. Total Imports of goods and services

2008

Thousand million pesos

Concepts	Total imports (1) (1=2+3+4)	Direct Purchases (2)	Recorded Imports (3)	Non-recorded Imports (4) (4=5+6+7+8+9+10)	BoP OPEC (5)	Smuggling (6)	Illicit crops (7)	Free Trade zones (8)	FISIM (9)	CIF/FOB Adjustment (National) (10)
Total	97.280	3.577	83.482	10.221	652	6.722	387	1.218	1.845	-603
Goods	87.704	1.369	77.379	8.956	629	6.722	387	1.218	-	-
Services	9.576	2.208	6.103	1.265	23	-	-	-	1.845	-603

Source: DANE, DSCN

5.3.5. CIF/FOB Adjustment on imports of goods

The general recommendation of the SNA is to record the imports of goods at FOB value, at the global level and in the accounts of the institutional sectors.

Nevertheless, as it was mentioned before, in the commodity flow balance of products, the imports of goods are registered at CIF values. This means that the value of the imports of goods includes the services of insurance and transport provided by resident and non-resident enterprises between the customs frontier of the exporting country and the customs frontier of Colombia. In order to register the total imports at FOB value, as recommended by SNA, the CIF/FOB adjustment is carried out that consists of excluding from the total CIF value of imports of goods, the total value of those services. In turn, the effect of this adjustment on the commodity flow balances of transport and insurance services is as follows: the BoP data corresponding to those services include the imports of services purchased by residents from non-residents for the transport between the place of production to the point of export but as this value is already included in the value of goods, it should be excluded; on the other hand, the services provided by residents for this same service are included in production and implicitly in intermediate consumption, but have to be treated as an export (a transaction between a resident and a non-resident), and are considered by convention as (-) imports.

In general terms this CIF/FOB adjustment consists of:

a) Subtracting globally from the CIF value of imports of merchandise the total value of freight and insurance on imports;
b) Distributing this global value between the different national accounts products to which it corresponds;
c) Including this adjustment in the balances of the corresponding products;
d) Verifying that the calculated values of services provided by residents and non-residents are logical and correspond to the expected values.

From the practical point of view, the following calculations are performed, whose method is illustrated with the 2008 data, (Table 68):

The total CIF/FOB adjustment on goods (4.872 thousand million pesos) is subtracted from the total CIF value of imports of goods (86.333 thousand million pesos), and once the adjustment for direct purchases of goods abroad (1.369 thousand million pesos) is taken into consideration, the total FOB value of imports of goods is obtained (82.830 thousand million pesos).

The total value of this adjustment is distributed among the different National Accounts products concerned as follows: land freight transport **(**225 thousand million pesos), water freight transport (3.685 thousand million pesos), air freight transport (776 thousand million pesos) and insurance (186 thousand million pesos).

These total values represent, on the one hand, services provided by residents (in the column “CIF/FOB adjustment on imports: Services provided by residents”) and on the other, services provided by non-residents (in the column “CIF/FOB adjustment on imports: services provided by non-residents”).

Table 68. Example CIF/FOB adjustment on imports.
Transport and insurances services
2008

Thousand million pesos

NA code	Product	Output by product at basic prices	sum of adjustments on supply: taxes and margins	CIF/FOB adjustment on imports			Imports		total suppy at purchasers prices
				total	Services provided by residents	Services provided by non residents	Goods (CIF value when detailed, FOB value when global)	Services (CIF/FOB adjusted)	
	Total goods (10-37)	304.264	95.465				86.333		486.062
	Services other than transport and insurance	445.874	(55.199)					3.683	394.358
46	Land transport services	32.810	(3.729)	(225)	(157)	(68)		71	28.927
47	Water transport services	1.066	18	(3.685)	(61)	(3.624)		3.743	1.142
48	Air transport services	5.045	200	(776)	(352)	(424)		1.594	6.063
49	Supporting and auxiliary transport services	6.486	90					209	6.785
51	Financial intermediation, insurance and auxiliary services	34.086	4.631	(186)	(35)	(151)		2.940	41.471
	Adjustments			-					-
	CIF/FOB adjustment on imports			4.872	605	4.267	(4.872)		-
	Direct purchases by residents abroad						1.369	2.208	3.577
	total	829.631	41.476	-			82.830	14.448	968.385

Source: DANE, DSCN

5.3.6. Imports and exports at constant prices

As explained in previous sections, the import and export of goods and services are first calculated at current prices. The different components of foreign trade are added at the national accounts classification (six-digit) product level (both recorded and unrecorded exports and imports). In a second stage, imports and exports are calculated at previous year´s constant prices and then, the indices obtained with respect to the previous year are chained, in order to establish the values at 2005 constant prices by chaining.

For the calculation at previous year´s constant prices, each product of the national accounts classification is deflated by the corresponding price index, as follows:

$$XPktePi_{n-1} = \frac{XPctePi_n}{IPPi_{n-1}}$$

$$MPktePi_{n-1} = \frac{MPctePi_n}{IPPi_{n-1}}$$

Where:

Pi_{n-1} = national accounts product i in period n-1

Pi_n= national accounts product i in period n

XPcte = Exports at current prices
XPkte = Exports at previous year's constant prices
MPcte = Imports at current prices
MPkte = Imports at previous year's constant prices
IPPin-1 = Price index of product i of period n with respect to period (n-1)

- **Price indices used**. In order to deflate the import and export of goods and services, different price indices are used, among them, the unit value index; producer price index, exported and imported; produced and consumed, and international price indices[108]. The selection process of indices depends on whether the product is homogeneous or heterogeneous.

  – **Homogeneous products**: If the product is homogenous, that is, a product whose unit price has a low variability among sources, the unit value index is chosen (twenty-nine products for exports and thirty-four for imports). A product is deemed to be homogeneous when the coefficient of variation of the price indices between sources is lower than 35%. Generally, primary products belong to this category.

  The coefficient of variation is defined as $cv = \frac{\bar{x}}{\sigma}$ where $\bar{x}$ is the average unit value of the different individually reported transactions and σ the standard deviation of the unit value.

  – **Heterogeneous products**: If the product is heterogeneous, that is, a product whose unit price has a high variability among sources, with a coefficient of variation over 35%, in most cases, the PPI base 99 is used, a price index calculated by DANE; in the case of products neither adjusted with the unit values index, nor with the PPI, price indices extracted from the Bureau of Labor Statistics or from the IMF are used. If the share of the value of the products of the tariff's classification corresponding to a unique national accounts product represents less than 50% of the item included in the PPI basket, the price indices is taken at a more aggregated level (that of division).

  This case is illustrated in Table 68 that presents the exports of the national accounts product 220300, (tanned or dressed fur skins and artificial fur; articles thereof - except headgear), in which most of the comprised elemental products have a coefficient of variation greater than 35%: the PPI of exported products belonging to ISIC code 18 (manufacture of wearing apparel; preparation and dyeing of skins) is used as a deflator. Table 69 presents the coefficients of variation for the two National Accounts products 220300 and 230201, corresponding to exports of year 2005.

Table 69. Heterogeneous products with coefficient of variation over 35%
2005

National Accounts		Coefficient of Variation	
Product Code	**Description**	**Minimum**	**Maximum**
220300	Tanned or dressed fur skins and artificial fur; articles thereof - except headgear	5,442	105,235

[108] This issue is explained in the "Quarterly Accounts base 2005 Methodology. DANE

230201	Luggage, handbags and the like, of leather, travel sets for personal toilet, sewing or shoe or clothes cleaning, of leather	0,471	268,693	

The following table shows the products that make up the PPI code 18:

Table 70. Products that make up the code 18 at ISIC classification level[109] and its share in the FOB value of exports
2005

ISIC Classification	CPC Subclass Classification	Produced and Consumed P&C Description	Customs tariff Subheading	Description	Share (%)FOB exports value
1810	28222	Men's or boys' shirts, underpants, pyjamas, dressing gowns and similar articles, knitted or crocheted	6105100000	Men´s or boys´ shirts knitted or crocheted of cotton.	3,4
			6107110000	Men´s or boys´ underpants, briefs, nightshirts, pyjamas, bathrobes, dressing gowns and similar articles, knitted or crocheted, underpants and briefs of cotton	14,0
			6105209000	Men's or boys' shirts, knitted or crocheted of man-made fibers, of artificial fibers	6,9
1810	28231	Men's or boys' suits, coats, jackets, trousers, shorts and the like, of textile fabric, not knitted or crocheted	6203110000	. Men´s boys ‘suits, ensembles, jackets, blazers, trousers, bib and brace overalls, breeches and shorts (other than swimwear); suits of wool or fine animal hair.	8,8
			6203410000	Men´s boys ‘suits, ensembles, jackets, blazers, trousers, bib and brace overalls, breeches and shorts of wool or fine animal hair	13,4
			6203430000	Men´s boys ‘suits, ensembles, jackets, blazers, trousers, bib and brace overalls, breeches and shorts of	8,6

[109] 109[1] Table 70 shows the correspondence with ISIC due to the fact that the PPI of produced and consumed products is defined in terms of this classification

				synthetic fibers	
			6203429000	Men´s boys ´suits, ensembles, jackets, blazers, trousers, bib and brace overalls, breeches and shorts - Other	0,0
			6203421000	Men´s boys´ suits, ensembles, jackets, blazers, trousers, bib and brace overalls, breeches and shorts trousers, bib and brace overalls, breeches and shorts of denim".	0,0
1810	28233	Women's or girls' suits, coats, jackets, dresses, skirts, trousers, shorts and the like, of textile fabric, not knitted or crocheted	6204620000	Women´s or girls´ suits, ensembles, jackets, blazers, dresses, skirts, divided skirts, trousers, bib and brace overalls, breeches and shorts (other than swimwear) of cotton	44,9

Source: DANE. DSCN

The PPI is an indicator of prices of the goods in the first channel of distribution, that is, where producer prices are practiced. The PPI is produced by DANE.

The US Bureau of Labor Statistics (BLS) produces series of price indices by product. Those indices are used when the USA is the main commercial partner.

The IMF publishes the price indices of international traded commodities. Some of these indices are used to deflate the series of imports.

Annex 12 shows the price indices used to deflate internationally traded commodities according to the national accounts classification.

5.4. GROSS FIXED CAPITAL FORMATION (GFCF)

5.4.1. Concept

Gross Fixed Capital Formation (GFCF) is defined as "the total value of a producer´s acquisition, less disposals, of fixed assets in the accounting period plus certain specified expenditure on services that adds to the value of non-produced assets" [110]. Not all goods included within the asset boundary are newly produced. Due to the long life of assets, they may change hands while they remain useful as fixed assets for their new owners. Thus it is important to define the existing fixed assets, as well as their treatment in the measurement of gross fixed capital formation.

[110] SCN 2008 paragraph 10.32

GFCF includes important classes of services due to the impact they have on the value of new or existing assets, such as improvements to existing assets and the cost of ownership transfer.

Fixed assets can be tangible or intangible and are obtained as a result of a production process within the country or abroad. Fixed assets' basic feature consists of their continuous use throughout the process of production during a period that is more than a year.

GFCF includes the following groups of products:

- Acquisitions, less disposals of new or existing tangible fixed assets that are used repeatedly in order to obtain final items, as follows: (these are identified by their product code of national accounts):

    - Cultivated Assets: In Colombia this includes: Coffee tree (product 010002), African palm plantations (product 021101), Sugar cane plantations (product 021102), Orchards, Cultivated grassland and others (product 021103), Planted forest; By-products related to forestry (040003) and Protective planted forests (product 040004).

    - Cattle for breading and milk production: Bovine cattle, live (product 030101), Swine, live (product 030301) and Sheep and goats, horses, asses, mules and hinnies, live (product 030302 and 030303).

- Machinery and equipment which includes: General purpose machinery (3201 except bearings, gears, gearing and driving elements, and parts thereof (product 320103); Special purpose machinery (3202); Television and radio transmitters and apparatus for line telephony or telegraph (330302); Radio broadcast and television receivers; apparatus for sound and video recording and reproducing; microphones, loudspeakers, amplifiers, etc. (330303); Medical appliances, precision and optical instruments, watches and clocks (3304); Furniture (350100); Music instruments (360201); Games and toys; Mary-go-round swings, shooting galleries and other fairground amusements (360203) and Prefabricated constructions (360204).

- Residential buildings that include: General construction services of residential buildings (product 410100) and installation, building completion and finishing services (product 410300).

- Transport equipment which includes: Motor vehicles, bodies, trailers and semi-trailers; parts and accessories thereof (products 340101, 340102, 340103, 340104, 340105); other transport equipment and parts thereof (products 340203, 340204, 340299); repair services of motor vehicles (product 440100).

- Other non-residential buildings corresponding to product 420200.

- Other structures, general construction services of civil engineering works, mining constructions and all important improvements of non-produced tangible assets related to land, that consist of acquisitions that result in significant improvements in the quantity, quality or productivity of land or that prevent their deterioration, such as the

construction of docks or others in order to recover land from the sea and the clearing of forests, rocks, etc. (products 410101, 420103, 420104, 420106, 420199).

- Intangible fixed assets: Computer services and related services from which the GFCF in software are estimated (product 530102); motion picture, video tape, television and radio program production and distribution services (590002).

- The cost of ownership transfer of non-produced assets. This includes the professional charges or commissions incurred by the unit acquiring the asset (product 530104) as well as the taxes payable on the transfer of ownership of the asset (a tax on product 520200).

Generally speaking, GFCF includes all important improvements of existing assets which represent significant changes in some of their characteristics such as renovations, reconstructions or enhancements that increase their yield, their productive capacity, or extend their service life.

Table 71 shows the current values of the GFCF by product corresponding to year 2008.

Table 71. Gross Fixed Capital Formation (GFCF), according to national accounts products 2008

Thousand million pesos

National Accounts Codes	Description	Value
Total		110.786
010002	Coffee trees	316
021101	African palm plantations	639
021102	Sugar cane plantations	132
021103	Orchards, cultivated grassland and others	145
030101	Bovine cattle, live	697
030301	Swine, live	115
030302	Sheep and goats, horses, asses, mules and hinnies, live	166
040003	Planted forests; by-products related to forestry (natural rubber, plant resins, cork, etc.)	5
040004	Protective planted forests	198
310202	Tanks, reservoirs and containers of iron, steel or aluminum; steam generators and parts thereof	657
320101	Internal combustion piston engines	446
320102	Pumps, compressors, hydraulic engines, and parts thereof	1.091
320104	Ovens and furnace burners and parts thereof	46
320105	Lifting and handling equipment and parts thereof	580
320199	Other general purpose machinery and parts thereof	1.881
320201	Agricultural or forestry machinery and parts thereof	430
320202	Machine-tools and parts and accessories thereof	699
320203	Machinery for metallurgy and parts thereof	90
320204	Machinery for mining, quarrying and construction, and parts thereof	2.293
320205	Machinery for food, beverage and tobacco processing, and parts thereof	443
320206	Machinery for textile, apparel and leather production, and parts thereof	463
320207	Weapons and ammunition and parts thereof	145
320208	Domestic appliances and parts thereof	533

320299	Other special purpose machinery and parts thereof	911
330101	Office and accounting machinery, and parts and accessories thereof	526
330102	Computing machinery and parts and accessories thereof	2.433
330201	Electric motors, generators and transformers, and parts thereof	890
330202	Electricity distribution and control apparatus, and parts thereof	441
330203	Insulated wire and cable; optical fiber cables	0
330302	Television and radio transmitters and apparatus for line telephony or telegraph	3.525
330303	Radio broadcast and television receivers; apparatus for sound and video recording and reproducing; microphones, loudspeakers, amplifiers, etc.	2.095
330401	Medical and surgical equipment and orthopedic appliances	740
330402	Instruments and appliances for measuring, checking, testing, navigating; industrial processes control equipment; parts and accessories thereof	1.497
330403	Optical instruments and photographic equipment, and parts and accessories thereof	565
340101	Special purpose motor vehicles; road motor units; crane lorries; bodies; trailers and semi-trailers and containers	1.345
340102	Public-transport type passenger motor vehicles	126
340103	Motor vehicles, for the transport of persons (private)	997
340104	Motor vehicles n.e.c. for the transport of goods	2.904
340105	Parts and accessories of motor vehicles	1.145
340203	Aircraft and spacecraft, and parts thereof	1.902
340204	Motorcycles, bicycles and parts thereof	1.058
340299	Ships, railway and tramway locomotives and rolling stock, other transport equipment n.e.c. and parts thereof	100
350100	Furniture	3.115
360201	Music instruments	44
360203	Games and toys; roundabouts, swings shooting galleries and other fairground amusements	484
360204	Prefabricated constructions	131
410100	General construction services of residential buildings	18.498
410200	General construction services of non-residential buildings	16.899
410300	Installation, building completion and finishing services	1.521
420101	General construction services of highways, streets, roads, railways, tunnels and subways, and airfield runways	8.787
420103	General construction services of harbors, waterways, dams, irrigation and other waterworks	6.934
420104	General construction services of long distance and local pipelines, communication and power lines (cables), and related works.	4.767
420106	General construction services of mines	9.280
420199	General construction services of others	1.929
440100	Repair services of motor vehicles	993
520200	Real estate services on a fee or contract basis	671
530102	Licensing services for the right to use computer software; computer consultancy services; online information provision services; data processing services; computer hardware servicing, repair and maintenance, etc.	1.125
530104	Legal, accounting, auditing; tributary advisory	125

	services; marketing studies; administration consultants; architecture, engineering and other technical services	
590002	Motion picture, video tape, television and radio programme production and distribution services	73

Source: DANE, DSCN

5.4.2. Calculation procedure.

GFCF is calculated based on two approaches: From the supply approach (products) and from the expenditure approach (institutional sectors). The estimates from both approaches are cross-classified in the GFCF matrix, from which final data are derived, which are then included in the account for products and for institutional sectors. The estimates by products and institutional sectors are calculated independently during the decentralized stage of the compilation and the matrix is set up during the synthesis process.

Gross Fixed Capital Formation (GFCF) by national accounts products. In order to establish GFCF, a proposal is first presented under the product approach. For some products, GFCF is directly derived from supply (production plus imports). For others, supply corresponds to the acquisitions of the institutional sectors, an information that results from the analysis of the fixed assets of the institutional sectors.

According to the type of product, the following indicators and calculation methods are used:

- GFCF in plantations of coffee trees, african palm, sugar cane, commercial and protective planted forest is equal to the production of these products;

- GFCF in products associated with livestock farming, for instance, female and male breeding stocks, is deduced from changes in stock of this type of livestock. This GFCF comprises the growth or decline of the livestock population attributable to an increase in the number of heads and also to a change in the existing inventory due to their change in maturity; it is estimated as the difference between the value of the final stock and that of the initial stock. To calculate the value of the inventory at the end of each year, a demographic model has been set up which considers livestock growth (births and imports) and its decrease (slaughtering, exports, natural death), first in terms of the number of heads and then taking into consideration the corresponding value of animals at different stages of development.

- In machinery and equipment, and transport equipment, GFCF is estimated on the basis of the supply of these products at purchasers' prices.

- In residential constructions, GFCF is calculated through the estimated production of these constructions.

- In non-residential constructions, GFCF is calculated from the production estimations for these constructions adjusted using the data collected from the institutional sectors accounts.[111]

[111] In non-residential buildings, the value derived from the building census and the processing of building licenses is adjusted taking into consideration the results derived from the analysis of the institutional sectors. This is due to the fact that in the

– The civil engineering works are estimated based on the financial statements of the institutions that acquire engineering works. The general government provides information on roads, tunnels, bridges and other infrastructure works, such as market places, parks, etc. that have been acquired by this sector. GFCF in water pipes, networks, hydroelectric plants, expenses in mining extraction, among others is calculated based on information from public and private public utilities and mining extraction enterprises.

– GFCF in the production of motion pictures is calculated using as an indicator the number of films produced during a year.

– The costs of ownership transfer that include taxes and transfer expenses (i.e. registry and other notary costs) are estimated from the number of documents registered and obtained from the Superintendency of Notaries and Registry; the professional charges and fees are derived from the production of legal services.

- **GFCF - Institutional Sectors** (Demand side). In order to establish the GFCF of the institutional sectors, a proposal of those transactions is presented, derived from the analysis of their financial statements. The information is the result of the transformation of accounting information into economic data, coming from the difference between the values of the balance sheets at the end of years *n* and *n-1*. The accounting items considered are those corresponding to buildings, construction in progress, machinery and equipment, furniture, software, mining exploration, etc. The difference of the values in the balance sheets is corrected by deducing the elements included in the financial statements and that are not part of the value of GFCF[112].

For non-profit institutions serving households - NPISH, an estimate is made based on the information received from political parties, trade unions, religious organizations, parents associations, clubs and NGOs.

This transformation is applied to the following GFCF transactions:

P5111 Dwellings
P5112 Other buildings
P5113 Other structures
P5114 Transport equipment
P5115 Other machinery and equipment
P5116 Cultivated assets
P5121 Acquisition of new intangible fixed assets
P5131 Major Improvements to non-produced non-financial assets
P5132 Cost of ownership transfer on non-produced non-financial assets

5.4.3. Construction of the GFCF matrix and calculation of the GFCF of the sectors without accounting information.

financial statements, the assets are recorded for their acquisition value that includes the related costs of ownership transfer (notary costs, taxes) and the value of own account construction of the sectors, whereas in the building census, these assets are valued at basic prices, excluding costs of ownership transfer. (see para 5.1.4)

[112] Section 9.3 presents the methodology used to calculate the GFCF of institutional sectors.

As it was explained above, once the GFCF has been calculated by products and institutional sectors, the GFCF matrix is set up. Setting up this matrix is part of the process of synthesis of the national accounts and it enables the reconciliation of data of supply and of demand and to obtain data of the GFCF of the sectors without accounting information: this is the case of the households sector, as households are considered as owners of unincorporated enterprises and of dwellings.

The starting point for building the matrix is the data calculated by products and institutional sectors; the estimates made are cross-classified and the GFCF final data are deduced under the two approaches.

According to the nature of each product and the relative quality of the data source available, in each case the data on GFCF to be privileged are determined: either the one resulting from the analysis of supply (production plus imports) or the one derived for the analysis of demand (institutional sectors).

For residential building, the starting point is the value of supply from which the value of institutional sectors is adjusted, since there is no source of information on all the sectors as there is no direct information on the GFCF of households. The estimate is made on the basis of the building census data complemented with data of construction licenses.

For non-residential buildings, the data derived from the institutional sectors accounts are privileged, since there is information available for those sectors. Additionally, in the financial statements, the assets are recorded at acquisition value (or production value) including the cost of ownership transfer (notary charges, taxes) and the value of the construction on own account of the sectors, whereas in the information of the product, the construction is valued at basic price, excluding the costs of ownership transfer.

For civil engineering works, the accepted data correspond to the demand by institutional sectors.

For machinery and equipment, transport equipment[113] and other categories, the accepted data correspond to supply as it includes both the data of the assets produced in the country and those of assets imported from abroad.

[113] For households, motor vehicles that are included in GFCF refer to SUV and high cylinder capacity cars which value is established for the base year, and is then estimated annually using the corresponding commodity flow balance

Table 72 shows the GFCF matrix of the institutional sectors and the corresponding products.

2008 Thousand pesos million

Transaction	Description transaction	National Accounts product codes	Total	NPISH	Households	Government	Financial corporations	Non-financial corporations
				79	28.301	13.635	862	67.909
P.5111	Dwelling	410101, 410300	20.019	0	20.019	0	0	0
P.5112	Other buildings	410200	16.899	72	403	1.925	416	14.083
P.5113	Other structures (civil engineering works)	420101, 420103, 420104, 420106, 420199	31.426	0	568	9.375	0	21.483
P.5114	Transport equipment	340101, 340102, 340103, 340104, 340105, 340203, 340204, 340299	10.570	4	5.010	614	14	4.928
P.5115	Other Machinery and equipment	310202, 320101, 320102, 320104, 320105, 320199, 320201, 320202, 320203, 320204, 320205, 320206, 320207, 320208, 320299, 330101, 330102, 330201, 330202, 330203, 330302, 330303, 350100, 360201, 360203, 360204	27.194	0	720	1.306	396	24.772
P.5116	Cultivated assets	010002, 021101, 021102, 021103, 030101, 030301, 030302, 040003, 040004	2.413	0	1.145	5	0	1.263
P.5121	Acquisition of new intangible fixed assets	530102, 590002	1.198	0	7	108	34	1.049
P.5131	Major improvements to non-produced non-financial assets	With civil engineering	271	0	0	267	0	4
P.5132	Costs of ownership transfer on non-produced non-financial assets	520200 and 530104	796	3	429	35	2	327

Source: DANE, DSCN

5.5. CHANGE IN INVENTORIES

In national accounts, the change in inventories represents the value of entries into inventories less the value of withdrawals. It includes the net increase of unsold goods during a given accounting period, of work-in-process or materials, packaging and other inputs that were not used during the period and were accumulated as inventories. It is measured by deducing from the value of entries into inventories the value of withdrawals, each valued at market prices at the time of incorporation or of withdrawal. The most commonly used accounting methods to value goods held in inventories at the end of the accounting period are the so-called LIFO (last-in- first-out), and FIFO (first-in-first-out) methods. Neither of the above methods adjusts to national accounts principles, hence, a deeper analysis and elaboration is necessary for its measurement.

5.5.1. Sources of Information

The change in inventories is mostly calculated using the available data derived from surveys, in particular, the annual manufacturing survey, EAM[114] and the annual trade survey EAC[115]; the change of inventories for live bovine cattle according to orientation is estimated from the cattle stock; and that of coffee from data provided by the National Federation of Coffee Growers. For other products such as petroleum, the information comes from the financial statements of enterprises of the sector.

5.5.2. Calculation method

The method used to calculate the change in inventories depends on whether the information available refers to quantity or to value. There is information available on the value of the initial and final inventories for the “wholesale and retail trade of vehicles” and for the manufacturing industry (products-in-process and goods for resale). For live cattle, manufacturing finished products, industrial raw materials and coffee, the information available is in quantity.

The change in inventories was estimated in a first stage for the 2000-2007 period, (to compile the series for the base period[116]) processing the data in chronological series, and for some section of it (in wholesale and retail trade, coffee and live cattle), consistently with quarterly accounts. For the following years, a similar method has been applied.

The changes in inventory at constant prices are not obtained by chaining as is the case for most variables of the system. They are calculated at current prices, at previous year´s constant prices and at 2005 constant prices. This is due to the fact that according to EUROSTAT[117], the variables of national accounts that can take positive, negative, close to zero or equal to zero values, as it is the case of changes in inventories, must not be chained since the method leads to large fluctuations in the chained indices which make their interpretation difficult.

For the measurement of changes in inventories, whether the information available corresponds to quantities or values, the first calculation is at 2005 constant prices; subsequently the calculation is made at current prices and finally, once all the elements of the change of inventories (materials and supplies, finished products, goods for resale,

[114] The information used from the EAM corresponds to chapters 6 and 8 that contain data in values and in quantities.
[115] The information used from the EAC corresponds to chapter 6 that contains the values of initial and final inventories.
[116] The base year was not compiled independently but as part of a series of years, in order to increase the reliability of estimations
[117] Eurostat 2005; Manual on the measurement of prices and volume in National Accounts

work-in-process and goods in commercial establishments) are grouped and classified according to the national accounts classification, the changes in inventories are deflated; the price index used is that of production for each product. Finally, the variable is calculated at previous year´s constant prices in order to include it in the product balances at previous year´s constant prices. Section 5.5.3 describes in detail the above-mentioned process.

- **Calculation from accounting information on the value of inventories.** In the annual manufacturing and trade surveys, the change in inventories is calculated by subtracting the value of the inventory at the beginning of the period from its value at the end of the period, after excluding the effect of valorization on the value of inventories.

CI= FI – II - valorization.

Where:
CI = Changes in inventories of the period
FI = Value of Final Inventory at the end of the reference period
II = Value of Initial Inventory at the beginning of the reference period

The valorization of inventories is due to the increase or decrease of its accounting value, associated with changes in prices even though no transaction has taken place (purchases, sales or production of goods and services). The amount of valorization is linked to the method of valuation and recording of inventories used by enterprises.

- **Calculation from information in quantities**. When the information available refers to quantities, the change in inventories is estimated by multiplying the changes in inventories in quantities by the average price of the current year (calculation at current prices) or by the 2005 prices[118]. This method is used to calculate the changes in inventories of coffee, inputs and finished products. The example below illustrates the procedure followed for the calculation of change in inventories at current and 2005 constant prices:

CI^{CP} = Changes in inventories at current prices.

CI^{CP} = *CIQ X Pr n.*

CI^{KP} = Changes in inventories at 2005 constant prices.

CI^{KP} = *CIQ X Pr b 2005*

Where:
CIQ = Changes in inventories in quantity.
Pr = Average price of the product during the current year.
Pr b 2005 = Average price of the product in 2005.

[118] This case does not present an effect on the valorization of inventories

5.5.3. Stages to estimate the change in inventories (CI).

To calculate the change in inventories a procedure such as that listed below is carried out. Depending on the availability of information, all or only part of the process needs to be completed.

1. Consistency analysis of the basic information.
2. Exclusion of the valorization effect and calculation of the changes in inventories at 2005 constant prices.
3. Calculation of the changes in inventories at current prices.
4. Calculation of the changes in inventories when there is information on quantity at current and at 2005 constant prices.
5. Classification according to the National Accounts product classification.
6. Calculation of changes in inventories at previous year´s constant prices.

Whenever the available information is reported in value, (distributive trade and manufacturing industry regarding goods-in-process and goods for resale) phases 1, 2, 3 and 5 have to be completed. When information is reported in quantities (finished products and inputs in the manufacturing industry), phases 1, 4 and 5 have to be completed.

Finally, phase 6 has to be completed once the components of the changes in inventories have been consolidated, and data are available in the National Accounts product classification (phase 5).

1. Consistency analysis of the basic information.

First of all, the information derived from surveys is analyzed and evaluated; for this purpose, relationships between variables are established, for instance, in trade, between the cost of sales and the value of sales, between the initial and the final inventories and the sales; for the manufacturing industry, between the quantities of initial and final inventory and that of total production.

The manufacturing industry is expected to present a cyclical process of reduction and accumulation of inventories. Consequently, the relationship between the accumulated change in inventories and production should tend to zero. For the 2000-2007 period, this relationship did not exceed 1,5%, a value that is derived relating the sum of CI over the 2000-2007 period and the sum of production (Pn) over the same period; a higher ratio would reflect inconsistencies with the basic information.

$$x = \frac{\sum_{n=1}^{n} CIn}{\sum_{n=1}^{n} Pn}$$

Where
Period n= 2000-2007
CI_n = Changes in inventories of the period n.
P_n = Domestic production of the period n.

In general terms for the manufacturing industry, the ratio did not exceed 1%, However, for some products, there were some ratios over 2%, which means that

the changes in inventories showed globally positive results and with a tendency towards permanently increasing or globally negative results and a tendency towards permanently decreasing. Those cases are possible if and only if the accumulation or reduction is small from one year to the other. Otherwise, in the first case, an unsustainable accumulation of stocks would be occurring, with decreasing sales and an increasing production which would eventually lead any enterprise to bankruptcy, or in the second case, an apparent depletion of inventories which would mean an unlikely high level of inventories at the beginning of the period, which is highly unrealistic.

The consistency analyses were made running the 2000-2007 series at the level of each commercial or industrial establishment, and covering the main industrial and commercial enterprises, because it is not possible to evaluate the quality of inventories observing only two consecutive years. The abnormal changes on these relationships led to a review of the data and to adjusting them in the case of error or to exclude the corresponding source if no adjustment was possible.

2. Exclusion of the valorization effect and calculation of the changes in inventories at 2005 constant prices.
The accounting values of stocks of inventories of the commercial and industrial enterprises implicitly carry a valorization component, which is linked to the valuation method they use in accounting for inventories. Because of that, the difference between the value of final inventory and that of initial inventory in some cases presents unrealistic results, for instance, inventory values always growing and whose value can represent between 40 to 50% of total value of sales in the distributive trade. This is due to the valuation method used that does not correspond to the valuation method recommended for the national accounts.

The valorization of inventories and the estimation of the changes in inventories at 2005 constant prices are calculated by deflating the final and the initial inventories separately by a price index. In order to define the price index to be used and the speed of rotation of inventories, some enterprises were consulted. The purpose was to establish the inventory system that they mainly use, the valuation method and the speed of rotation of inventories.

According to those consultations, it was possible to establish that the inventory system mostly used is that of the permanent inventory; the valuation method mostly used is LIFO (Last In, First Out) meaning that inventories, at the end of the year, are valued at the price of the last purchase made by the establishment; and finally that, on average, the speed of rotation of inventories is around three months.

Consequently, the deflators that must be used correspond to the average of the last three months of year *n-1* of the CPI or the PPI, (according to the ISIC activity), for the case of the initial inventory, and the average of the last three months of year *n* in the case of the final inventory.

Hence:

Initial Inventory at 2005 prices =II/deflator n-1.
Final Inventory at 2005 prices = FI/deflator n.

Where:

deflator n-1= Average price index of the last three months of the previous year (October, November and December) (year 2005 =100)

deflator n= Average price index of the last three months of the current year, (year 2005 =100)

Therefore:
CI = FI/deflator n - II/deflator n-1

Where CI represents the changes in inventories at 2005 prices.

It is then necessary to convert the available price indices (PPI or CPI) into indices year 2005 = 100).

The method is explained using as an example the calculation of the changes in inventories at 2005 constant prices of establishments classified in the ISIC activity Rev 3. 5133 (Wholesale of footwear).

The opening information is as follows:

Initial inventories Value = 32.144 million pesos
Final inventories Value = 46.114 million pesos

The deflators are calculated taking into account the information of Table 73.

Table 73. Average Consumer Price Index (CPI) of footwear for the months of October, November and December

1999 and 2000

Index base 2005=100

CPI Description and Period	Average	October	November	December
Footwear -1999	98,22	98,1	98,3	98,2
Footwear -2000	100,89	100,4	100,9	101,4

Source: DANE, DSCN

Initial inventory deflator = 98,22
Final inventory deflator = 100,89

The change in inventories for year 2000 for the wholesale of footwear at 2005 constant prices is equal to:

CI (5133) 2000= (46.114/100,89) x 100 - (32.144/98.22) x 100 = 12.981 million pesos

3. Calculation of changes in inventories at current prices.
For wholesale and retail trade of vehicles and the components of industry that handle inventories in value and by activity, the changes in inventories at current

prices are calculated by multiplying[119] the changes in inventories at 2005 constant prices, by an annual average price index. This process is described in the following example:

CI= (FI/deflator n - II/deflator n-1) x (average price index year n).

Where price index n= annual average of the index (PPI-CPI) (expressed in terms of 2005 base year =100) according to activity.

Annual Average 2000 of the CPI of footwear= 99,49

CI (current prices) = (12.981 x 99,49) /100 = 12.915 million pesos

4*. Calculation of the changes in inventories when information is reported in quantities*.

As it was explained for the components of the manufacturing industry, such as materials and supplies and finished products, the information available is in quantities. Once the consistency analyses of the information has been performed, the changes in inventories are calculated by multiplying the difference in quantity between the final and initial inventory by the average implicit price derived from the EAM, in year 2005 (for calculation at 2005 constant prices) and in the current year (for calculation at current prices). In the case of materials and supplies, as there is no direct information on inventories in quantities, the information is deduced from the purchases, quantities consumed and balances of transactions among establishments of the same enterprise.

The following example shows the process for the basic chemical product “Terpenes and polyterpenes aromatizers”.

Quantity purchased in year 2000 = 2.686 kilograms.
Quantity consumed in year 2000 = 2.281 kilograms.
Balances of transactions among establishments in year 2000 = -390 kilograms.

QCI2000 = Changes in inventories in quantities in year 2000.

QCI2000 = 2686 - 2281 + (- 390) = 15.

Once the changes in inventories in quantities are obtained, it is necessary to value them according to the type of accounts that are being calculated. For the calculation of the accounts at 2005 constant prices, the quantities are multiplied by the average annual 2005 price, whereas for current price estimates, the price used is the average price for the current year.

The above is illustrated in the following example:

QCI 2000=15
Pb2005=1500.
CI base 2005 =15 x 1500=22.500 million pesos

[119] For this calculation, the same price index as the one chosen as deflator is used, but in this case, using the average annual index.

Where Pb2005 = Average 2005 price
CI base 2005 = Change in inventories at 2005 constant prices.

QCI 2000=15
P2000=1050
CI (current value) = 15 x 1050 = 15.750 million pesos

Where;
P2000= Average price of the current year.
CI (current value) = Changes in inventories at current prices.

5. Classification according to the National Accounts product classification.
As was previously mentioned, for distributive trade, the changes in inventories are available at the total level according to the ISIC distributive trade activity; considering that the results should be provided following the national accounts product classification, an homologation procedure is used to match the ISIC distributive trade classification of economic activities with the national accounts product classification, under the assumption that the total stock of inventories reported by an enterprise belonging to an activity, corresponds to only one class of products of national accounts. In the case where one ISIC class corresponds to more than one National Accounts product, the value of inventories is distributed among products according to the structure of production.

Table 74 illustrates the situation in the case of chemical products

Table 74. Correspondence between the ISIC economic activity "Wholesale and retail trade" and the National Accounts product classification

Classification ISIC Rev 3	Description	National Accounts product classification	
		Products Codes	Products Description
5135	Wholesale of pharmaceutical and medical goods, cosmetic and toilet articles	280202 280203	Pharmaceutical products - Soap, cleaning preparations, perfumes and toilet preparations
5231	Retail sale of pharmaceutical and medical goods, cosmetic and toilet articles, in specialized stores		
5142	Wholesale of paint and related products		
5242	Wholesale and retail trade paintings in establishments retail specialized	280201	Paints and varnishes and related products
5153	Wholesale of basic chemicals, plastic and rubber in primary forms and agrochemical products	280101 280102 280105 280106	Basic organic chemicals Basic inorganic chemical n.e.c. Fertilizers and pesticides Plastics in primary forms

Source: DANE, DSCN

On the other hand, with respect to the changes in inventories for the industrial components where information is available in quantities, as is the case of materials and supplies and finished products, the allocation of products to the national

accounts classification is direct, as the information is available according to the CPC eight-digit industrial product classification and each of them has its correspondence with a unique item in the national accounts product classification, as is illustrated in Table 75.

Table 75. Correspondence between the Central Product Classification (CPC) and the National Accounts product classification, for chemicals

National Accounts Classification	Description	Central Product Classification (CPC)	Description
280101	Basic organic chemicals	34111014	Hexane
		34111022	Pentane
		34112011	Acetylene
		34112029	Ethylene
		34112045	Propylene
		34113017	Terpenes and polyterpenes aromatizers

Source: DANE, DSCN

6. Calculation of the changes in inventories at previous year´s constant prices
In order to incorporate these estimates in the commodity flow balances at previous year´s prices it is also necessary to calculate the change in inventories at previous year´s constant prices which is performed as follows:

Once the values of the changes in inventories at current prices have been obtained, for each component, (materials and supplies, finished products, goods-in-process, goods for resale and trade) and have been aggregated and classified according to the national accounts product classification, they are deflated using the PPI (for produced and consumed products) corresponding to each product, which is also the one used to compile this variable at previous year´s constant prices. Thus for example, for national accounts product 280101 (basic organic chemicals), the change in inventories for year 2008 at 2007 constant prices is obtained as follows:

Firstly, from the results of the EAM the implicit index price of 2008 in relation to 2007 for product 280101 is calculated, a value of = *96,5*

Secondly, the change in inventories of 2008 at current prices is calculated for this product, which equals 16 thousand million pesos.

The value of the change in inventories of product 280101 of 2008 at 2007 constant prices, equals:

(16/96.5) x 100 = 17 thousand million pesos

5.5.4. Results for the variable: Change in inventories.

Tables 76 and 77 show the changes in inventories at current prices for the 2000-2007 period. Table 76 displays the results derived from the EAC and EAM following the methodology previously explained, while in Table 76 the results are consolidated at the level of the national accounts two-digit product classification. Table 77 also includes the estimation of the change in inventories of agricultural and mining products, which are

obtained using different sources, as well as the adjustments which result from balancing supply and demand.

Table 76. Results of Change in Inventories (CI) by source and components
Current prices (EAM and EAC only)
2000-2007 series

Thousand million pesos

Concepts	2000	2001	2002	2003	2004	2005	2006	2007
Total EAC	**331**	**193**	**281**	**95**	**579**	**517**	**1.314**	**1.434**
CI in distributive trade	331	193	281	95	579	517	1.314	1.434
Total EAM	827	532	451	560	1.421	1.148	1.800	1.355
CI finished products	165	64	-96	-138	319	504	140	156
CI materials and supplies	478	294	312	417	768	433	1.157	941
CI work-in-process and goods for resale	183	174	235	281	334	210	503	258

Source: DANE, DSCN

Table 77. Change in Inventories (CI), classified according to the national accounts product classification
Current prices
2000-2007 Series

Thousand million pesos

National Accounts Product codes a/	2000	2001	2002	2003	2004	2005	2006	2007
Total	**1.547**	**1.426**	**1.068**	**1.461**	**1.877**	**1.908**	**3.032**	**2.472**
1	-30	-78	-14	42	24	-79	12	63
2	37	89	-103	127	-10	-166	-170	19
3	134	174	330	343	233	359	284	388
6	30	103	101	-21	-61	-27	247	-112
7	249	123	24	196	-159	237	-207	-463
8	49	44	-4	50	43	63	-15	10
9	1	0	1	1	0	1	0	0
10	33	-9	-11	59	41	0	32	-1
11	26	24	27	62	73	16	45	106
12	7	54	32	-34	20	30	-30	26
13	34	11	16	63	65	32	73	-16
14	44	-10	22	-22	14	-62	65	61
15	-17	-9	-37	16	12	-11	37	16
16	-1	21	-15	0	-17	45	-6	-5
17	169	389	-89	-100	152	-113	54	202
18	-112	13	-99	38	-9	145	-9	112
19	5	-3	15	4	-11	6	-19	1
20	124	30	82	44	113	-38	76	51
21	49	37	31	42	-4	24	71	26
22	104	15	74	57	114	5	148	-71
23	16	-10	9	35	54	30	-15	42
24	12	6	-8	23	-11	-8	1	12
25	70	0	56	9	10	199	22	132
26	48	-14	112	-22	3	6	10	48

27	-56	56	-34	-40	83	27	-31	39
28	222	231	281	191	88	378	630	378
29	48	30	77	19	101	135	117	33
30	71	-26	66	81	239	77	271	249
31	96	-6	4	95	147	318	388	305
32	21	44	23	-41	89	-28	114	73
33	87	37	10	27	102	92	235	145
34	-64	22	105	41	268	170	519	466
35	-13	10	-12	15	-2	2	-17	24
36	54	30	12	49	37	9	81	95
37	0	-2	-16	12	36	34	19	18

Source: DANE, DSCN
a/ See Annex 2 for further description of product codes

6. SYNTHESIS OF TRANSACTIONS IN GOODS AND SERVICES

The synthesis of transactions in goods and services is carried out through the following stages:

- Compilation of the production matrices
- Compilation of the Commodity Flow Balance (BOU) of products
- Construction of intermediate consumption matrices
- Compilation of the generation of income account by industry

6.1 COMPILATION OF PRODUCTION MATRICES

For every year of the series, production matrices are constructed at current and previous year's constant prices. Such calculations are performed for 369 products and 61 industries.

The production matrix is first calculated at current prices for each year *n*, and then at previous year's constant prices.

6.1.1. Production matrix of year *n* at current prices.

In order to build the production matrix at year *n* current prices, two types of data are used: the structure of the production matrix of year *n-1* by products and industries and the production calculated for year *n* available in some cases by products and in others by industries, based on a variety of data sources[120]. The methodology of construction of the matrix is explained using a simplified example of a production matrix (Table 78) which corresponds to year *n-1*; in this matrix, industries A, B and D are calculated using the product approach while industry C is calculated using the production approach.

Based on data from Table 78, the distribution coefficients are calculated (Table 79): they present how the output of one product is produced by the different industries. For instance, 99% of product A is produced by industry A and 1% by industry D.

[120] In some industries such as agriculture, where data in quantities and prices are prevalent, the production is calculated from the product approach; in others, such as the manufacturing industry, government or financial intermediaries, the information comes from enterprises and establishments, and production is established using the product and industries approach based on different data sources. For further explanation see Sections 5.1.3 and 5.1.6.

Table 78. Production Matrix at current prices

Year n-1 Thousand million pesos

Products	Industries				
	Total	A	B	C	D
Total	48.505	13.430	16.205	10.200	8.670
A	13.120	13.000	0	0	120
B	16.350	350	16.000	0	0
C	9.250	50	150	9.000	50
D	9.785	30	55	1.200	8.500

Source: DANE, DSCN

Table 79. Production Matrix. Coefficients of Distribution

Year n-1

Products	Industries				
	Total	A	B	C	D
A	1	0,99	0	0	0,01
B	1	0,02	0,98	0	0
C	1	0,01	0,02	0,97	0,01
D	1	0	0,01	0,12	0,87

Source: DANE, DSCN

- **If the output data is derived from information on products,** this output is distributed among industries, applying the structure of the production matrix of the previous year (*n-1*), that is, using the coefficients of distribution as estimated in Table 78. For year *n* the output of products A, B and D is estimated in: 13.776, 17.495 and 10.470 thousand million pesos respectively. Applying the coefficients of distribution of this output in year *n-1*, the output is allocated to industries that produce these products as follows (Table 80).

Table 80. Production Matrix by products and industries

Thousand million pesos

Products	Industries				
	Total	A	B	**C**	D
A	13.776	13.650	0	0	126
B	17.495	375	17.120	0	0
C a/	0	0	0	**0**	0
D	10.470	32	59	1.284	9.095

Source: DANE, DSCN

a/ In this case, at this stage, data for product C are not calculated, since they are derived using various industry sources as explained further on.

- **If the output data are based on an estimation from data on economic activities coming from different sources.** The procedure is different as illustrated below in the example with industry C. The production of this industry is calculated based on different data sources and the products that correspond to each data source, as follows: the starting point is the output of year *n-1* broken down into the different components coming from different data sources. In the case of Industry C, its production derives from data sources 1, 2 and 3, each of them informing on different products[121] (Table 81).

Table 81. Production of Industry C according to data sources and products

Year n-1

Thousand million pesos

Products	Industry C according to data sources			
	Total	1	2	3
Total	10.200	4.080	1.020	5.100
A	0	0	0	0
B	0	0	0	0
C	9.000	3.600	900	4.500
D	1.200	480	120	600

Source: DANE. DSCN

Based, in some cases on the information from economic surveys, and in others, on the financial statements of corporations or government entities, value indices of output of year *n* as compared to year *n-1* are calculated for each of the sources used for Industry C and the products produced by the industry (Table 82)[122]. If there were no information available for some data source at the level of products to build the values corresponding to year *n-1*, (for example, case of data source 3), it is assumed that all the products have identical behavior as the total output of this data source.[123]

Table 82. Value Index of the production of Industry C, by sources and products

Year n/Year n-1

Products	Industry C by sources		
	1	2	3
Total	--	--	108
A	--	--	--

[121] Section 5.1.6 describes the methodology used to calculate the output of industries combining different sources of information.

[122] The value indices of year *n* within these industries must be calculated with the same breakdown as that used for year n-1.

[123] Data sources such as industrial, trade and services surveys; financial statements of financial corporations and government enable a breakdown of production by product. Similarly, estimates by production chains are made by products; this is not the case of the employment source in which production is determined according to the main activity of the enterprise, without distinguishing between products: in such a case, it is assumed that all produced products evolve according to the same index value.

B	--	--	--
C	108	109,5	108
D	109	103	108

Source: DANE, DSCN

--: Not applicable

The production of year *n* of Industry C is calculated by multiplying the production of year *n-1* (Table 81) by the value indices of Table 82. The results appear in Table 83.

Table 83. Production of Industry C, calculated by products and **sources**

Year n

Thousand million pesos

Products	Industry C by data sources			
	Total industry C year *n*	1	2	3
Total	11.028	4.411	1.109	5.508
A	0	0	0	0
B	0	0	0	0
C	9.734	3.888	986	4.860
D	1.295	523	124	648

Source: DANE, DSCN

At this stage of the process, there are two figures for some cells of the matrix, for example 1.284 (Table 80) and 1.295 (Table 83) thousand million pesos for product D, produced by Industry C (Table 84). In other cells there is no data for example for product C, produced by industries A, B and D (Table 84)[124].

Table 84. Summary of the data of the production matrix

Year n

Thousand million pesos

Products	Industries				
	A	B	C		D
			Original data calculated by products	Original data calculated by industries	
A	13.650	0	0	0	126
B	375	17.120	0	0	0
C	0	0	0	9.734	0
D	32	59	1.284	1.295	9.095

Source: DANE, DSCN

When there are two figures, the figure derived from industry sources is prioritized, 1.295 thousand million pesos in the example; for the cells without information by source, the

[124] If a cell of the production matrix has data in year n-1, data must appear in year n, unless it has been proved that the production of this product has ceased.

value index calculated by products is used[125]; for this example, the value index calculated for product C is assumed to be 108,0.

The production matrix for year *n* at current prices resulting from this process is presented in Table 85.

Table 85. P**roduction Matrix calculated at current prices**

Year n

Thousand million pesos

Products	Industry				
	Total	A	B	C	D
Total	51.752	14.110	17.339	11.028	9.275
A	13.776	13.650	0	0	126
B	17.495	375	17.120	0	0
C	10.001	54	161	9.734	54
D	10.481	32	59	1.295	9.095

Source: DANE, DSCN

Once the production matrix has been obtained, its consistency is analyzed by setting a relationship between the output of a product and that of its corresponding characteristic industry. This matrix should not be so different from that of year *n-1*, unless a significant change in the composition of the secondary production of industries is confirmed.

As a guiding variable of the change in the pattern of production of the industries, a value index is compiled which is derived from the analysis of financial statements of the corporations that make up the different industries, an information that comes from the institutional sectors accounts.

6.1.2. Compilation of the production matrix of year n at previous year´s (n-1) *constant prices*

The production matrix of year *n at* previous year´s constant prices is built by deflating (dividing) each of the cells of the matrix at current prices by the price index of the production (of year n in relation to the previous year) defined for each product. Table 86 presents the price indices of year n calculated for products A, B, C and D.

Table 86. Price indices of output by products

Year n-1= 100

Products	Index
A	101
B	103
C	104
D	103

Source: DANE, DSCN

[125] In the particular case of products deriving from the manufacturing industry, a value index of production is determined from the results of the Annual Manufacturing Survey (EAM).

Using the production matrix of year *n* at current prices (Table 85) and the price indices of products (Table 86) the matrix of year *n* at previous year´s constant prices is derived. The results are shown in Table 87.

Production Matrix at current prices of year n / PI by products = Production matrix of year n at previous year´s constant prices

Table 87.Production Matrix for *year n* at year *n-1* constant prices

Thousand million pesos

Products	Industries				
	Total	A	B	C	D
Total	50.416	13.961	16.833	10.616	9.006
A	13.640	13.515	0	0	125
B	16.985	364	16.621	0	0
C	9.616	51	154	9.359	51
D	10.175	31	57	1.257	8.830

Source: DANE, DSCN

6.2 COMPILATION OF THE COMMODITY FLOW BALANCE (BOU)[126]

The purpose of this stage of the process is to balance the estimates of supply and of use of products. The BOU is calculated for the 369 products defined in the 2005 national accounts' product classification[127], at current and at previous year´s constant prices.

6.2.1. Incorporation of supply and use data in the worksheets.

Firstly, the elements of supply and use which have been calculated independently are included for each year at current and at previous year´s constant prices, that is, imports, exports, HFCE[128], government and NPISHs[129] final consumption expenditure, change in inventories, GFCF, intermediate consumption, the estimates of taxes on products, and the trade and transport margins. The output and intermediate consumption data included in the worksheets derive from the production and intermediate consumption matrices. See Sections 6.1 and 6.3.

The taxes on products, as well as the trade and transport margins are estimated at constant prices assuming the same volume growth rate as that corresponding to the demand on which they fall. The above-described treatment supposes that all changes with respect to rates, actual or implicit (for example the change attributable to improvements in the collection processes of taxes) have to be understood as a price effect and not as a volume effect.

[126] This stage is carried out simultaneously with the compilation of the intermediate consumption matrix, see explanation under Section 6.3.
[127] Presented in Annex B
[128] Chapter 5 explains the method used to calculate production, imports, HFCE, change in inventories and GFCF.
[129] See chapter 13 for further explanation.

Annex 13 presents the worksheet used to include data and to set up the BOU applied to the product “potatoes” calculated for years 2007 (current prices) and 2008. (2007 prices and current prices).

6.2.2. Cross-checking the supply and use data and reconciliation of the implicit values of the variables in the balances.

Once the data are included, the results are cross-checked and the difference between estimates from supply and from demand is established (if any). These differences can lead to changes in the estimations performed in the previous stage.

For each product it is necessary to achieve a balance between supply and use at current prices and at previous year´s constant prices.

This identity between supply and use is achieved after several analyses such as:

- Reviewing the deflators used for each of the variables included in supply and in demand.
- Reviewing the coherence that must exist in the input-output relationships corresponding to productive processes associated with productive chains.
- In general, assuring that each elements of supply and demand have the sufficient temporary consistency both in volume and prices terms, within the national and international macroeconomic environment.

6.3 COMPILATION OF THE INTERMEDIATE CONSUMPTION MATRIX

While validating the commodity flow balance (BOU) of products, the intermediate consumption matrices are compiled and adjusted at current and previous year’s constant prices. These matrices are the instrument enabling the different approaches for GDP measurement to be reconciled: the production approach (the value added of industries) and the expenditure approach. The matrices are estimated for 369 products and 61 industries.

In current years, the Intermediate Consumption (IC) is calculated using an iterative process. In each stage of the process a provisional assumption is set in order to approach final intermediate consumption data, both by industries and products. This means that several versions of IC matrices are compiled, under different assumptions, until reaching a final result, always taking the intermediate consumption matrix of the previous year as a starting point.

To set up the intermediate consumption matrix, and given the complexity of the task mostly due to the number of products and activities to be taken into consideration, not all the information required is available to develop a detailed work. Even though, for some industries, their intermediate consumption in some products is known from surveys or specific sources, in most cases, the changes in volume, prices or value for each of the

intermediate consumption items are unknown. For that reason, assumptions for both the changes in volume and in price are used.

The stages to compile the intermediate consumption matrix are the following:

1. Projection of the year (n-1) matrix to year (n)
2. Incorporation of fixed cells
3. Reconciliation of the IC derived from the intermediate consumption matrix with the Commodity Flow Balances (BOU)

6.3.1 Projection of the year (n-1) matrix to year (n)

The projection of the year (n-1) matrix is carried out in two steps: first, the matrix of year (n) is projected at year (*n-1)* constant prices and then, this matrix is projected at year (n) current prices.

- **Projection of the year (n) intermediate consumption matrix at year (*n-1)* constant prices.** This matrix is obtained by applying the assumption of short-term stability of technical coefficients at constant prices for each industry. Therefore, for each industry, its intermediate consumptions of products of year (n) at year (n-1) constant prices are obtained by applying to the corresponding values of the intermediate consumption matrix of year (n-1) at current prices the volume index of the production of the industry of year (n) with respect to year (n-1)[130].

  It is worth recalling that the volume indices of production by industry are derived from the corresponding production matrices (comparing the matrix of year (n), at previous year´s constant prices, with the matrix of year (*n-1) at* current prices), see further explanation under Section 6.1.

  In practice, the above procedure can be summarized in the following identity:

IC matrix year n-1 at current prices x VI of production of industries n/n-1 = IC matrix year n at (n-1) constant prices

Let us take as an example an intermediate consumption matrix of year *n-1 at* current prices (Table 88). Once multiplied by the volume indices of the production of industries, (Table 89, column 3), a first estimate can be obtained of the intermediate consumption matrix of year *n* at year *n-1* constant prices (Table 90).

From the analysis of the matrix by rows, the total intermediate consumption of products are deduced[131]; thus, for product A, the intermediate consumption of year (n) at year (n-1) constant prices equals 2.807 thousand million pesos.

Table 88. Intermediate Consumption Matrix of year *n-1* at current prices

Thousand million pesos

Products	Industries				
	Total	A	B	C	D
Total	21.000	7.150	4.950	7.300	1.600

[130]This method of projection assumes that the technology of production from one year to another one is unchanged.
131 They correspond to the portion of the product dedicated to intermediate consumption

A	2.700	100	0	2.500	100
B	2.050	50	150	1.800	50
C	10.200	5.500	2.500	1.500	700
D	6.050	1.500	2.300	1.500	750

Source: DANE, DSCN

Table 89. Volume indices of production, by industry

Industries	Industry Production		
	Year *n-1* at current prices (Thousand million pesos)	Year *n at n-1* constant prices (Thousand million pesos)	Volume indices
	(1)	(2)	(3) (3=2/1)
A	13.430	13.961	103,95
B	16.205	16.833	103,88
C	10.200	10.616	104,08
D	8.670	9.006	103,88

Source: DANE, DSCN.
Note: The partial data do not add up due to approximation

Table 90. Intermediate consumption matrix of year (n) at (n-1) constant prices

Thousand million pesos

Products	Industries				
	Total	A	B	C	D
Total	21.837	7.439	5.147	7.588	1.664
A	2.807	104	0	2.599	104
B	2.129	52	156	1.870	52
C	10.616	5.724	2.602	1.561	729
D	6.284	1.558	2.389	1.558	779

Source: DANE, DSCN

- **Intermediate consumption matrix of year (n) at current prices**. The intermediate consumption matrix of year (n) at current prices is obtained by multiplying each row of the matrix of year (n) at (n-1) constant prices (Table 90 in the example) by the price indices defined for each product (Table 91)[132]. The results are shown in Table 92.

Table 91. Price indices of Products´ Intermediate Consumption

Year n-1 = 100

Products	Price Index
A	102,1
B	102,5
C	103,4
D	103,5

[132] Usually, the same Price index is used for all intermediate consumption

Source: DANE, DSCN

Table 92. Intermediate Consumptions Matrix of year *n* at current prices

Thousand million pesos

Products	Industries				
	Total	A	B	C	D
Total	22.530	7.691	5.323	7.797	1.719
A	2.866	106	0	2.653	106
B	2.183	53	160	1.917	53
C	10.977	5.919	2.690	1.614	753
D	6.504	1.613	2.473	1.613	806

Source: DANE, DSCN

After the projection, the obtained matrix is named “pure projected Intermediate Consumption matrix”.

6.3.2. Incorporation of fixed cells

In this stage the so-called “fixed cells” are integrated within the projected matrix. The fixed cells correspond to the intermediate consumption of a given product by a certain industry and for which there is direct information. They are included into the matrix as exogenous data, for example, the crude petroleum consumed by industry 27 “Manufacture of coke, refined petroleum products and nuclear fuel” or the live cattle consumed by industry 10 “Production, processing and preservation of meat and fish”.

In the case of financial intermediation services, the value of intermediate consumption of FISIM by each industry is determined directly. At this stage the control is also made on productive chains and data from the institutional sectors’ accounts are included. In general, these cells are known in value.

The rule applied is as follows: If the cell is fixed, then the figure that appears in the projected matrix is substituted by the value of the fixed cell; if no such data exist, the figure of the projected matrix is maintained.

The following are the fixed cells included in the matrix:

- The FISIM consumed by industries
- The intermediate consumption corresponding to the following industries:
    - Industry 38 - Production, transmission and distribution of electricity
    - Industry 39 - Manufacture of gas including that of coke oven products; distribution of gaseous fuels through mains; steam and hot water supply
    - Industry 40 - Water collection, treatment and supply;
    - Industry 54 - Public administration and defence; compulsory social security
    - Industry 56 - Non-market education
      Industry 57 - Market health and social work

The fixed cells are initially included in the matrix at current prices, because the corresponding information is available in value. The corresponding values at constant

prices are obtained by deflating the current values by the price indices of the intermediate consumption of each of the products.

6.3.3. Reconciliation of the IC derived from the intermediate consumption matrix with the Commodity Flow Balances (BOU)

In the third stage the projected matrix including the fixed cells is compared and adjusted with data of supply and demand of products. In fact, when for a given product, the different cells corresponding to the columns of this matrix are added, the total intermediate consumption of this product is obtained, which is usually different from the data of intermediate consumption that is deduced as the balancing item of supply and use of the corresponding product worksheet. The reconciliation of the two figures is performed by adjusting the matrix of intermediate consumption.

A new matrix of Intermediate consumption is calculated that has almost the same structure as the projected matrix except that it respects the total figure from the worksheet, though preserving the data of the fixed cells. The following rule is applied:

- If a given cell is fixed, this figure is maintained in the matrix;
- If the cell is variable, for each row of the matrix, the difference between the total of the row (the product) and the value obtained as a balancing item in BOU is distributed among the industries in proportion to the data that appear in the projected matrix, after deducing the data of the fixed cells.

According to this procedure, totally consistent intermediate consumption by products and industries is obtained. In the resulting matrix not only the fixed cells values have been included but also the intermediate consumption by product calculated and recorded in the BOU. The total intermediate consumption of the productive system is now consistent from the two approaches, from the product perspective and from the industry perspective.

The consistency of the intermediate consumption matrix is achieved by analyzing the changes of the value added of different industries, obtained as the difference between the value of production of each industry and the value of its intermediate consumption. For this purpose, the changes of production and intermediate consumption derived from the original financial statements of enterprises and government entities are used as an element of reference.

By construction, one would expect that at constant prices, the volume index of value added has the same evolution as that of production. Nevertheless, the changes of values added can be different from those of production due to the inclusion of the fixed cell process and other adjustments resulting from managing exogenous information. These differences in the changes in volume of the variables of production and intermediate consumption, after adjustments, can modify the technical coefficients originally estimated, altering the evolution of value added.

The consistency of the intermediate consumption matrix, after adjustments, is achieved by reviewing the industries with greater distortions in the volume of their value added as a result of unequal growth in the volume of their production and of their intermediate consumption; these can be caused by either the deflators used for production or by deficiencies in recording intermediate consumption as a result of the iterative processes in reconciling commodity flow balances and intermediate consumption matrices.

- **Synthesis of taxes on products, and the trade and transport margins**. At a second stage the calculated data are reconciled with the income of government and with the production account of the wholesale and retail trade industry.

The income reported by government on taxes derived from the productive process and in particular those linked to the trading of goods and services (import duties, VAT and specific taxes such as those on fuel and alcoholic beverages) must be in full coherence with the values recorded in the commodity flow balances. In the iterative process of compilation of the balance, this coherence is not achieved since the recorded taxes can be greater or smaller than the values reported by government, in which case, a process of reconciliation at a more detailed level of the product classification is developed until achieving identity.

- **Calculation of Gross Domestic Product, GDP**. Once the commodity flow balances of products are culminated, the balances and production accounts by industries are added in order to obtain the aggregates corresponding to the total economy, among which total GDP.

Although in all the previous stages of the analytical process a “rigorous review” of their results and trends has been undertaken, at the time of the general synthesis, they are put under a new level of scrutiny of consistency from the different approaches (production, expenditure and income), at current and at previous year´s constant prices.

In the review of GDP from the production approach, in particular, the coherence of the value added of the different industries, the causes of the growth of GDP are analyzed by industry. Those industries whose growth significantly deviates from the national average are subject to a further review covering the basic supporting information and the calculations performed.

In the review of GDP from the expenditure approach, the final consumption growths are analyzed in light of the dynamics observed in employment, in affiliation to the social insurance system, in the sales of consumption goods, as well as in the consumer price indices. The volume and price indices of GFCF are analyzed both from the perspective of the performance of the construction industry (buildings, civil engineering works) as well as from that of imports of capital goods. Regarding exports and imports, the coherence of the price indices is analyzed in order to validate their consistency.

In relation to the remuneration of the factors of production that comprise value added (compensation of employees, operating surplus and mixed income) the tendency of their share in total GDP is reviewed, which can lead to a revision of the values initially compiled.

7. CHAINING THE ACCOUNTS AT CONSTANT PRICES

In the final stage of the process and once the goods and services accounts at current prices and at previous year´s constant prices have been balanced, the indices are chained for each variable to obtain the values at 2005 constant prices by chaining[133]. This is done at all levels where aggregations are performed[134].

This approach is described and presented in the following example of the value added of the tabulation category corresponding to the mining industry; the same approach applies to all the tabulation categories of industries, total value added, GDP, and all elements of demand. In the case of household final consumption expenditure (HFCE), data can be aggregated by product groups, purpose of the expenditure, and level of durability. In each grouping, the same procedure applies; the same occurs for gross fixed capital formation (GFCF), exports and imports of goods and services, etc.

The tabulation category called “mining industry, mining and quarrying” comprises four industries: 06-Mining of coal and lignite; extraction of peat; 07-Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction excluding surveying; 08-Mining of metal ores; and 09-Quarrying of non-metallic minerals.

The point of departure is the data for each of the variables, production, intermediate consumption and value added, calculated at current prices (Table 93) and at previous year´s constant prices (Table 94). The value added of the tabulation category is obtained as the difference between the value of the production of the tabulation category and its total intermediate consumption.

Table 93. Production, Intermediate Consumption (IC), and Value Added (VA) of the tabulation category “Mining and Quarrying industry” at current prices

2005-2008 Thousand million pesos

National Accounts Classification	Mining and Quarrying	2005	2006	2007	2008
	Production	*27.765*	*32.497*	*33.582*	*48.789*
06	Mining of coal and lignite; extraction of peat	6.312	7.326	7.360	12.034
07	Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction excluding surveying; mining of uranium and thorium ores	16.690	18.782	18.757	30.212
08	Mining of metal ores	3.286	4.599	5.376	4.179
09	Quarrying of non-metallic minerals	1.477	1.790	2.089	2.364
	Intermediate Consumption	*6.394*	*7.148*	*7.860*	*9.965*
06	Mining of coal and lignite; extraction of peat	1.506	1.734	1.880	2.670
07	Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction excluding surveying; mining of uranium and thorium ores	3.309	3.505	3.851	5.243

[133] The discussion on the relevance of using chaining in order to compile national accounts in volume is discussed in Chapter 3.

[134] The supply and use tables are only built at current prices and at previous year´s constant prices, because the balance between supply and demand does not apply at constant prices by chaining.

08	Mining of metal ores	1.230	1.488	1.613	1.472
09	Quarrying of non-metallic minerals	349	421	516	580
	Value Added	*21.371*	*25.349*	*25.722*	*38.824*
06	Mining of coal and lignite; extraction of peat	4.806	5.592	5.480	9.364
07	Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction excluding surveying; mining of uranium and thorium ores	13.381	15.277	14.906	24.969
08	Mining of metal ores	2.056	3.111	3.763	2.707
09	Quarrying of non-metallic minerals	1.128	1.369	1.573	1.784

Source: DANE, DSCN

Table 94. Production, Intermediate Consumption and Value Added of the "Mining and Quarrying industry", at previous year´s constant prices

2005-2008

Thousand million pesos

National Accounts Classification	Mining and Quarrying	2005	2006	2007	2008
	Production				
06	Mining of coal and lignite; extraction of peat	5.354	7.012	7.877	7.857
07	Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction excluding surveying; mining of uranium and thorium ores	14.126	16.578	18.938	21.656
08	Mining of metal ores	3.400	3.201	4.331	5.135
09	Quarrying of non-metallic minerals	1.458	1.609	1.976	2.223
	Intermediate consumption	*5.925*	*6.510*	*7.394*	*8.666*
06	Mining of coal and lignite; extraction of peat	1.288	1.681	1.898	2.100
07	Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction excluding surveying; mining of uranium and thorium ores	3.081	3.274	3.621	4.456
08	Mining of metal ores	1.225	1.184	1.405	1.562
09	Quarrying of non-metallic minerals	331	371	470	548
	Value added	*18.413*	*21.890*	*25.728*	*28.205*
06	Mining of coal and lignite; extraction of peat	4.066	5.331	5.979	5.757
07	Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction excluding surveying; mining of uranium and thorium ores	11.045	13.304	15.317	17.200
08	Mining of metal ores	2.175	2.017	2.926	3.573
09	Quarrying of non-metallic minerals	1.127	1.238	1.506	1.675

Source: DANE, DSCN

Comparing the value of each variable for the current year at previous year's constant prices with their previous year's current value, volume indices are calculated considering previous year's value as 100. This is illustrated in Table 95[135]. For instance, the volume index of production in 2008 (109,8) for the total mining industry, is obtained by dividing the production of year 2008 at 2007 constant prices, Table 94 (36.871), by the value of production of year 2007 at current prices that figures in Table 93 (33.582).

Table 95. Production, Intermediate Consumption (IC) and Value Added (VA) for the tabulation category "Mining and Quarrying industry"

Volume indices base *n-1 = 100*

2006-2008

National Accounts Classification	Mining and Quarrying	2006	2007	2008
	Production	*102.3*	*101.9*	*109.8*
06	Mining of coal and lignite; extraction of peat	111,1	107,5	106.8
07	Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction excluding surveying; mining of uranium and thorium ores	99.3	100.8	115.5
08	Mining of metal ores	97.4	94.2	95.5
09	Quarrying of non-metallic minerals	108.9	110.4	106.4
	Intermediate consumption	*101.8*	*103.4*	*110.3*
06	Mining of coal and lignite; extraction of peat	111.6	109.5	111.7
07	Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction excluding surveying; mining of uranium and thorium ores	98.9	103.3	115.7
08	Mining of metal ores	96.3	94.4	96.8
09	Quarrying of non-metallic minerals	106.3	111.6	106.2
	Value added	*102.4*	*101.5*	*109.7*
06	Mining of coal and lignite; extraction of peat	110.9	106.9	105.1
07	Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction excluding surveying; mining of uranium and thorium ores	99.4	100.3	115.4
08	Mining of metal ores	98.1	94.1	95.0
09	Quarrying of non-metallic minerals	109.8	110.0	106.5

Source: DANE, DSCN

Using the volume indices, it is possible to calculate the values at 2005 constant prices by chaining of all the variables of the system, multiplying the values of year 2005 (at current prices) by the successive volume indices. For example, the production of year 2008 of the "Mining and Quarrying industry" tabulation category is obtained as follows:

*Year 2006: 27.765 * (102.3/100) = 28.400*
*Year 2007: 28.400 * (101.9/100) = 28.946*

[135] These are obtained by dividing the values of year *n* at previous year´s constant prices by the values of year *n-1* at current prices.

*Year 2008: 28.946 * (109.8/100) = 31.781*

The mining aggregates results and the total corresponding to the tabulation category are shown in Table 96. In these accounts, a *"Statistical discrepancy*" is generated every time that the value of a variable "at constant prices by chaining" is compared with the sum or difference of its components. For this example, at the level of the tabulation category, the statistical discrepancy for production is -100 in 2007 and -336 in the 2008, in both cases, close to 1%.

Table 96. Production, Intermediate Consumption (IC) and Value Added (VA) of the tabulation category "Mining and Quarrying Industry", at 2005 constant prices by chaining

2005-2008

Thousand million pesos

National Accounts Classification	Mining and Quarrying	2005	2006	2007	2008
	Production	*27.765*	*28.400*	*28.946*	*31.781*
06	Mining of coal and lignite; extraction of peat	6.312	7.012	7.539	8.048
07	Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction excluding surveying; mining of uranium and thorium ores	16.690	16.578	16.716	19.299
08	Mining of metal ores	3.286	3.201	3.014	2.879
09	Quarrying of non-metallic minerals	1.477	1.609	1.776	1.890
	Discrepancy	*0*	*0*	*-100*	*-336*
	Intermediate consumption	*6.394*	*6.510*	*6.734*	*7.425*
06	Mining of coal and lignite; extraction of peat	1.506	1.681	1.840	2.055
07	Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction excluding surveying; mining of uranium and thorium ores	3.309	3.274	3.382	3.914
08	Mining of metal ores	1.230	1.184	1.118	1.083
09	Quarrying of non-metallic minerals	349	371	414	440
	Discrepancy	*0*	*0*	*-20*	*-67*
	Value added	*21.371*	*21.890*	*22.217*	*24.362*
06	Mining of coal and lignite; extraction of peat	4.806	5.331	5.700	5.988
07	Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction excluding surveying; mining of uranium and thorium ores	13.381	13.304	13.339	15.392
08	Mining of metal ores	2.056	2.017	1.897	1.801
09	Quarrying of non-metallic minerals	1.128	1.238	1.362	1.450
	Discrepancy	*0*	*0*	*-80*	*-269*

Source: DANE, DSCN

Table 97 presents the *discrepancies* between the value added of the four industries obtained by chaining and the value added calculated as the difference between production and intermediate consumption[136].

Table 97. Statistical discrepancy. Value Added (VA) of the "Mining and Quarrying industry", at 2005 constant prices by chaining.

2005-2008

Thousand million pesos

National Accounts Classification	Mining and Quarrying	2005	2006	2007	2008
	Value added	0	0	5.1	5.4
'06	Mining of coal and lignite; extraction of peat	0	0	0.5	-5.1
'07	Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction excluding surveying; mining of uranium and thorium ores	0	0	5.5	6.2
'08	Mining of metal ores	0	0	0.5	4.5
'09	Quarrying of non-metallic minerals	0	0	-0.1	-0.1

Source: DANE, DSCN

It can be observed that, as expected, there is no statistical discrepancy for years 2005 and 2006 since for those years, the accounts are balanced by construction: the accounts for year 2005 are at current prices, and those for 2006, at previous year´s prices.

[136] This discrepancy is calculated from the data in Table 96.

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Glossary

- **Acquisition less disposals of valuables:** Valuables are produced goods of considerable value that are not used primarily for purposes of production or consumption but are held as stores of value over time.

- **Base year:** the base year lf a series of national accounts is the year for which the accounts have been compiled in a more detailed way, and in which the basic levels of the variables have been determined.

- **Basic price:** The basic price is the amount receivable by the producer from the purchaser for a unit of a good or service produced as output minus any tax payable, and plus any subsidy receivable, by the producer as a consequence of its production or sale. It excludes any transport charges invoiced separately by the producer.

- **Chained index:** A chained index is an index that has been constructed in such a way that it is made of the product of successive indexes, all having the same formula, and by which adjacent periods are compared.

- **Changes in inventories**: Changes in inventories are measured by the value of the entries into inventories less the value of withdrawals and less the value of any recurrent losses of goods held in inventories during the accounting period.

- **Commodity Flow Balances:** see **Product balance**

- **Compensation of employees:** Compensation of employees is defined as the total remuneration, in cash or in kind, payable by an enterprise to an employee in return for work done by the latter during the accounting period.

- **Constant prices:** Accounts at constant prices are accounts that are compiled using the prices of a period other than the current period. Comparing accounts at constant prices is a way of removing the effects of differences in prices in the comparison.

- **Constant prices by chaining:** Using chained volume indexes to extrapolate the base year value of a variable to the current period is compiling this variable at constant prices by chaining.

- **Consumption of fixed capital**: Consumption of fixed capital is the decline, during the course of the accounting period, in the current value of the stock of fixed assets owned and used by a producer as a result of physical deterioration, normal obsolescence or normal accidental damage

- **Consumption of goods and services**: Consumption of goods and services is the act of completely using up the goods and services in a process of production or for the direct satisfaction of human needs or wants.

- **Consumption**: The activity of consumption consists of the use of goods and services for the satisfaction of individual or collective human needs or wants.

- **Current prices:** current prices are price prevailing in the current period.

- **Deductible VAT:** Deductible VAT is the VAT payable on purchases of goods or services intended for intermediate consumption, gross fixed capital formation or for resale that a producer is permitted to deduct from his own VAT liability to the government in respect of VAT invoiced to his customers.

- **Economic Aggregates**: Economic Aggregates are figures related to general macroeconomic variables that can be derived from national accounts compilation.

- **Economically significant prices**: Economically significant prices are prices that have a significant effect on the amounts that producers are willing to supply and on the amounts purchasers wish to buy. These prices normally result when (a) the producer has an incentive to adjust supply either with the goal of making a profit in the long run or, at a minimum, covering capital and other costs and (b) consumers have the freedom to purchase or not purchase and make the choice on the basis of the prices charged.

- **Establishment**: An establishment is an enterprise, or part of an enterprise, that is situated in a single location and in which only a single productive activity is carried out or in which the principal productive activity accounts for most of the value added.

- **Expenditure measure of GDP:** The expenditure measure of gross domestic product (GDP) is derived as the sum of expenditure on final consumption plus gross capital formation plus exports less imports

- **Expenditures on goods and services**: Expenditures on goods and services are defined as the values of the amounts that buyers pay, or agree to pay, to sellers in exchange for goods or services that sellers provide to them or to other institutional units designated by the buyers.

- **Export subsidies**: Export subsidies consist of all subsidies on goods and services that become payable by government when the goods leave the economic territory or when the services are delivered to non-resident units.

- **Export taxes**: Export taxes consist of taxes on goods or services that become payable to government when the goods leave the economic territory or when the services are delivered to non-residents.

- **Final consumption expenditure**: Final consumption expenditure is the amount of expenditure on consumption goods and services.

- **Final consumption expenditure of households** see household final consumption expenditure

- **Final consumption expenditure of general government** see general government final consumption expenditure

- **Final consumption expenditure of NPISHs**: Final consumption expenditure of NPISHs consists of the expenditure, including expenditure whose value must be estimated indirectly, incurred by resident NPISHs on individual consumption goods and services and possibly on collective consumption services.

- **Financial Intermediation Services Indirectly Measured (FISIM):** Financial Intermediation Services Indirectly Measured represent the value of the services implicitly charged to lenders and borrowers by the financial intermediaries charging interests rates that are higher (or lower) than required as compared to an equilibrium rate.

- **Fixed assets**: Fixed assets are produced assets that are used repeatedly or continuously in production processes for more than one year.

- . **Fixed cells**: fixed cells are cells of the intermediate consumption matrix which value is known, and as a consequence, should not be estimated in the process of estimation of the matrix in current years.

- **General government final consumption expenditure:** General government final consumption expenditure consists of expenditure, including expenditure whose value must be estimated indirectly, incurred by general government on both individual consumption goods and services and collective consumption services.

- **Goods and services account:** The goods and services account shows the balance between the total goods and services supplied as resources to the economy as output and imports (including the value of taxes less subsidies on products not already included in the valuation of output) and the use of the same goods and services as intermediate consumption, final consumption, capital formation and exports.

- **Goods:** goods are physical, produced 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

- **Gross capital formation**: Gross capital formation shows the acquisition less disposal of produced assets for purposes of fixed capital formation, inventories or valuables.

- **Gross fixed capital formation**: Gross fixed capital formation in a particular category of fixed asset consists of the value of producers' acquisitions of new and existing products of this type less the value of their disposals of fixed assets of the same type.

- **Gross fixed capital formation**: Gross fixed capital formation is measured by the total value of a producer's acquisitions, less disposals, of fixed assets during the

accounting period plus certain specified expenditure on services that adds to the value of non-produced assets.

- **Gross value added:** Gross value added is the value of output less the value of intermediate consumption.

- **Gross value added at basic prices:** Gross value added at basic prices is defined as output valued at basic prices less intermediate consumption valued at purchasers' prices.

- **Gross value added at producers' prices** Gross value added at producers' prices is defined as output valued at producers' prices less intermediate consumption valued at purchasers' prices.

- **Household final consumption expenditure:** Household final consumption expenditure consists of the expenditure, including expenditure whose value must be estimated indirectly, incurred by resident households on individual consumption goods and services, including those sold at prices that are not economically significant and including consumption goods and services acquired abroad.

- **Import duties:** Import duties consist of customs duties, or other import charges, that are payable on goods of a particular type when they enter the economic territory.

- **Import subsidies:** Import duties consist of subsidies on goods and services that become payable when the goods cross the frontier of the economic territory or when the services are delivered to resident institutional units.

- **Income measure of GDP**: The income measure of gross domestic product (GDP) is derived as compensation of employees plus gross operating surplus plus gross mixed incomes plus taxes less subsidies on both production and imports.

- **Individual consumption good or service**: An individual consumption good or service is one that is acquired by a household and used to satisfy the needs or wants of members of that household.

- **Industry**: An industry consists of a group of establishments engaged in the same, or similar, kinds of activity.

- **Interest**: Interest is a form of income that is receivable by the owners of certain kinds of financial assets, namely deposits, debt securities, loans and (possibly) other accounts receivable for putting the financial asset at the disposal of another institutional unit.

- **Intermediate consumption:** Expenditures on goods and services consists of the value of the goods and services consumed as inputs by a process of production, excluding fixed assets whose consumption is recorded as consumption of fixed capital.

- **Inventories**: Inventories are produced assets that consist of goods and services, which came into existence in the current period or in an earlier period, and that are held for sale, use in production or other use at a later date.

- **Invoiced VAT**: Invoiced VAT is the VAT payable on the sales of a producer. It is shown separately on the invoice that the producer presents to the purchaser.

- **Market output**: Market output consists of output intended for sale at economically significant prices.

- **Market producers**: Market producers are establishments, all or most of whose output is market production.

- **Net borrowing** see net lending

- **Net lending**: Net lending is defined as the difference between changes in net worth due to saving and capital transfers and net acquisitions of non-financial assets (acquisitions less disposals of non-financial assets, less consumption of fixed capital). If the amount is negative it represents net borrowing.

- **Non-deductible VAT**: Non-deductible VAT is VAT payable by a purchaser that is not deductible from his own VAT liability, if any.

- **Non-market output**: Non-market output consists of goods and individual or collective services produced by non-profit institutions serving households (NPISHs) or government that are supplied free, or at prices that are not economically significant, to other institutional units or the community as a whole.

- **Other subsidies on production**: Other subsidies on production consist of subsidies except subsidies on products that resident enterprises may receive as a consequence of engaging in production.

- **Other subsidies on products**: Other subsidies on products consist of subsidies on goods or services produced as the outputs of resident enterprises, or on imports, that become payable as a result of the production, sale, transfer, leasing or delivery of those goods or services, or as a result of their use for own consumption or own capital formation.

- **Other taxes on production**: Other taxes on production consist of all taxes except taxes on products that enterprises incur as a result of engaging in production.

- **Output for own final use**: Output for own final use consists of products retained by the producer for his own use as final consumption or capital formation.

- **Output:** Output is defined as the goods and services produced by an establishment, excluding the value of any goods and services used in an activity for which the establishment does not assume the risk of using the products in production, and excluding the value of goods and services consumed by the same establishment except for goods and services used for capital formation (fixed capital or changes in inventories) or own final consumption.

- **Price index:** A price index is an index representing the change of the price of a variable as compared to its level in the reference year.

- **Principal activity**: The principal activity of a producer unit is the activity whose value added exceeds that of any other activity carried out within the same unit A.

- **Producer's price**: The producer's price is the amount receivable by the producer from the purchaser for a unit of a good or service produced as output minus any VAT, or similar deductible tax, invoiced to the purchaser. It excludes any transport charges invoiced separately by the producer.

- **Product balance:** The product balance for any product recognizes that the sum of output at basic prices plus imports plus trade and transport margins plus taxes on products less subsidies on products is equal to the sum of intermediate consumption, final consumption and capital formation, all expressed at purchasers' prices, plus exports

- **Production**: Production is an activity, carried out under the responsibility, control and management of an institutional unit, that uses inputs of labour, capital, and goods and services to produce outputs of goods and services.

- **Production measure of GDP:** The production measure of gross domestic product (GDP) is derived as the value of output less intermediate consumption plus any taxes less subsidies on products not already included in the value of output

- **Products:** Products are goods and services (including knowledge-capturing products) that result from a process of production

- **Purchaser's price**: The purchaser's price is the amount paid by the purchaser, excluding any VAT or similar tax deductible by the purchaser, in order to take delivery of a unit of a good or service at the time and place required by the purchaser. The purchaser's price of a good includes any transport charges paid separately by the purchaser to take delivery at the required time and place.

- **Saving**: Saving represents that part of disposable income (adjusted for the change in pension entitlements) that is not spent on final consumption goods and services

- **Secondary activity:** A secondary activity is an activity carried out within a single producer unit in addition to the principal activity and whose output, like that of the principal activity, must be suitable for delivery outside the producer unit. ..

- **Services:** Services are the result of a production activity that changes the conditions of the consuming units, or facilitates the exchange of products or financial assets.

- **Social contributions**: Social contributions are actual or imputed payments to social insurance schemes to make provision for social insurance benefits to be paid.

- **Subsidies:** Subsidies are current unrequited payments that government units, including non-resident government units, make to enterprises on the basis of the levels of their production activities or the quantities or values of the goods or services that they produce, sell or import.

- **Subsidy on product A**: subsidy on a product is a subsidy payable per unit of a good or service.

- **Supply table:** A supply table at purchasers' prices consists of a rectangular matrix with the rows corresponding to the same groups of products as the matching use tables and columns corresponding to the supply from domestic production valued at basic prices plus columns for imports and the valuation adjustments necessary to have total supply of each

- **Taxes:** Taxes are compulsory, unrequited payments, in cash or in kind, made by institutional units to government units

- **Taxes and duties on imports:** Taxes and duties on imports consist of taxes on goods and services that become payable at the moment when those goods cross the national or customs frontiers of the economic territory or when those services are delivered by non-resident producers to resident institutional units.

- **Taxes less subsidies on production**: Taxes less subsidies on production consist of taxes payable or subsidies receivable on goods or services produced as outputs and other taxes or subsidies on production, such as those payable on the labour, machinery, buildings or other assets used in production. Taxes on imports, excluding VAT and duties consist of all taxes (except VAT and import duties) as defined in the GFSM/OECD classifications that become payable when goods enter the economic territory or services are delivered by nonresidents to residents.

- **Taxes on products**: A tax on a product is a tax that is payable per unit of some good or service

- **Taxes on products, excluding VAT, import and export taxes**: Taxes on products, excluding VAT, import and export taxes consist of taxes on goods and services that become payable as a result of the production, sale, transfer, leasing or delivery of those goods or services, or as a result of their use for own consumption or own capital formation.

- **Technical coefficients:** technical coefficients are associated with intermediate consumption matrix. They represent the share of the value of a given input to the value of the corresponding output.

- **Trade margin**: A trade margin is defined as the difference between the actual or imputed price realized on a good purchased for resale and the price that would have to be paid by the distributor to replace the good at the time it is sold or otherwise disposed of.

- **Use table**: A use table at purchasers' prices consists of a set of product balances covering all products available in an economy arranged in the form of a rectangular

matrix with the products, valued at purchasers' prices, appearing in the rows and the columns indicating the disposition of the products to various types of uses.

- **Value added**: value added is the value of output less the value of intermediate consumption.

- **Value added tax**: A value added type tax (VAT) is a tax on goods or services collected in stages by enterprises but that is ultimately charged in full to the final purchasers.

- **Value index**: A value index represent the change in the value of a given variable between two periods of time.

- **Volume index**: A volume index is an average of the proportionate changes in the quantities of a specified set of goods or services between two periods of time.