

Production and Income II

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Contents

- Please Read Me
- Purpose
- Inflation adjustments in GDP
- Economics sectors and GDP
- Macroeconomic identity
- Resource of interest
- Acknowledgments
- References

Please Read Me

- Check the message **Welcome greeting** published in the News Bulletin Board.
- Dear student please edit your profile uploading a photo where your face is clearly visible.
- The purpose of the virtual meetings is to answer questions and not to make a summary of the study material.
- This presentation is based on ([Cardenas 2020, chap. 2](#))

Purpose

Understand how production is measured using the concept of Gross Domestic Product (GDP)

Inflation adjustments in GDP

- Initially the Gross Domestic Product is expressed in current Local Currency Units (LCU) which is the sum of monetary values
- A particular monetary value is the product of a quantity and a unit price
- A change in the level of Gross Domestic Product, measure in current LCU, is a combination of changes in quantities and prices
 - Inflation adjustments, applied to GDP, **try** to eliminate the changes of prices
 - There are 2 approaches to make inflation adjustments ([ABS 2003](#)):
 - **Constant price estimates**
 - **Chain volume measures**

Inflation adjustments in GPD

- **Chain volume measures** is the alternative used by the Departamento Administrativo Nacional de Estadística (DANE) to make inflation adjustments
 - A gentle introduction to this approach is explained in ([ABS 2003](#))
 - The monetary values adjusted using **chain volume measures** are not additive. This means that the sum of the components of an aggregate is not necessarily equal to the aggregate
 - In addition to the values adjusted using **chain volume measures**, DANE reports a value known as statistical discrepancy because of non additivity

Inflation adjustments in GPD

- Expenditure/Final demand approach using chain volume measures and expressed in thousands of millions (Colombia)

Concepto	2015	2020 ^a	2021 ^b
Gasto de consumo final	670201	724348	826403
Gasto de consumo final individual de los hogares y las ISFLH ^c	551013	583229	668234
Gasto de consumo final del gobierno general	119188	141280	158367
Formación bruta de capital	191305	153548	168799
Exportaciones	125936	103373	118074
Importaciones	182750	160786	205051
Producto interno bruto	804692	819114	905639
Discrepancia estadística	0	-1369	-2586

Source: DANE - Cuentas Nacionales Anuales - Producto Interno Bruto (PIB) - Series encadenadas de volumen con año de referencia 2015

Last update: 2022-06-14

^a Provisional data

^b Preliminary data

^c Instituciones sin fines de lucro que sirven a los hogares

Inflation adjustments in GPD

- Expenditure/Final demand approach using current prices and expressed in thousands of millions (Colombia)

Concepto	2015	2020 ^a	2021 ^b
Gasto de consumo final	670201	875658	1038063
Gasto de consumo final individual de los hogares y las ISFLH ^c	551013	704209	842222
Gasto de consumo final del gobierno general	119188	171449	195841
Formación bruta de capital	191305	192197	232245
Exportaciones	125936	134736	191936
Importaciones	182750	203872	285550
Producto interno bruto	804692	998719	1176694

Source: DANE - Cuentas Nacionales Anuales - Producto Interno Bruto (PIB) - Precios corrientes

Last update: 2022-06-14

^a Provisional data

^b Preliminary data

^c Instituciones sin fines de lucro que sirven a los hogares

Economics sectors and GDP

- ISIC adapted for Colombia ([DANE 2020](#), p 85)

Section Division Description		
A	01-03	Agricultura, ganadería, caza, silvicultura y pesca
B	05-09	Explotación de minas y canteras
C	10-33	Industrias manufactureras
D	35	Suministro de electricidad, gas, vapor, y aire acondicionado
E	36-39	Distribución de agua; evacuación y tratamiento de aguas residuales, gestión de desechos y actividades de saneamiento ambiental
F	41-43	Construcción
G	45-47	Comercio al por mayor y al por menor; reparación de vehículos automotores y motocicletas
H	49-53	Transporte y almacenamiento
I	55-56	Alojamiento y servicios de comida
J	58-63	Información y comunicaciones
K	64-66	Actividades financieras y de seguros

Economics sectors and GDP

- ISIC adapted for Colombia ([DANE 2020](#), p 85)

Section Division Description		
L	68	Actividades inmobiliarias
M	69-75	Actividades profesionales, científicas y técnicas
N	77-82	Actividades de servicios administrativos y de poyo
O	84	Administración pública y defensa; planes de seguridad social de afiliación obligatoria
P	85	Educación
Q	86-88	Actividades de atención de la salud humana y de asistencia social
R	90-93	Actividades artísticas, de entretenimiento y recreación
S	94-96	Otras actividades de servicios
T	97-98	Actividades de los hogares en calidad de empleadores; actividades no diferenciadas de los hogares individuales como productores de bienes y servicios para uso propio
U	99	Actividades de organizaciones y entidades extraterritoriales ^a

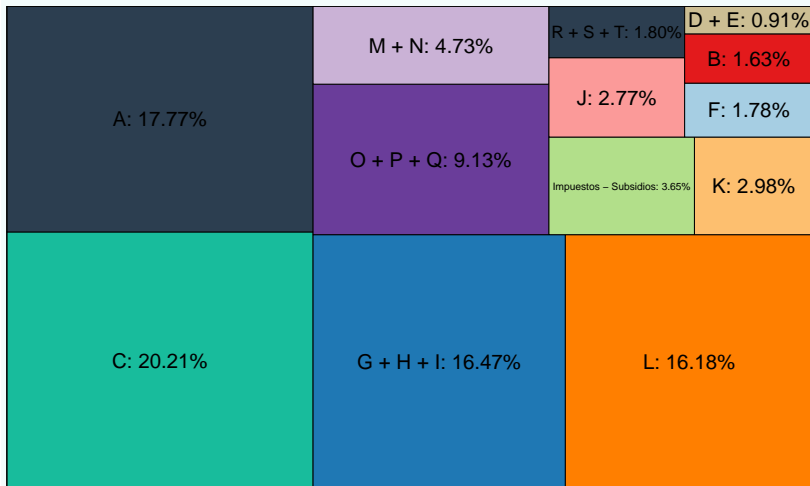
^a Because of extraterritoriality, in the context of international law, the production

Economics sectors and GDP

Sectors and share in GDP for Colombia

Period: 1975

Observation: Monetary values at current prices are used because of chain volume measures non-additivity



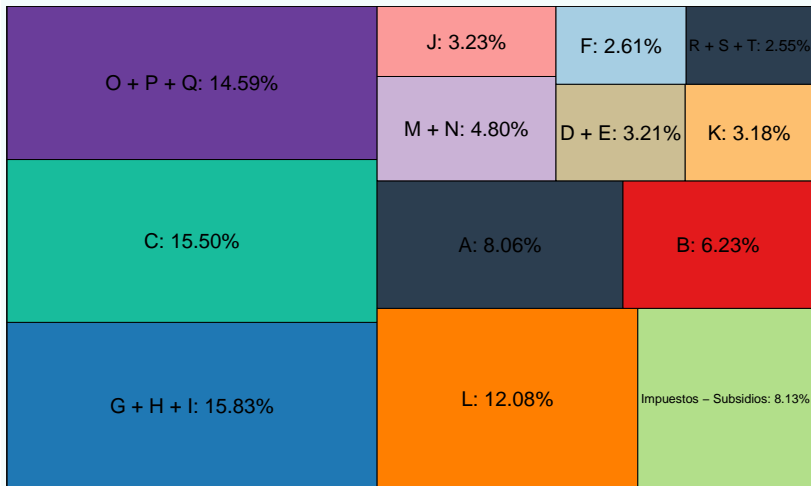
Source: DANE – Cuentas Nacionales Anuales – Retropolación Base 2015 – PIB enfoque de la producción y del gasto a precios corrientes
Update: 2022-06-12

Economics sectors and GDP

Sectors and share in GDP for Colombia

Period: 2000

Observation: Monetary values at current prices are used because of chain volume measures non-additivity



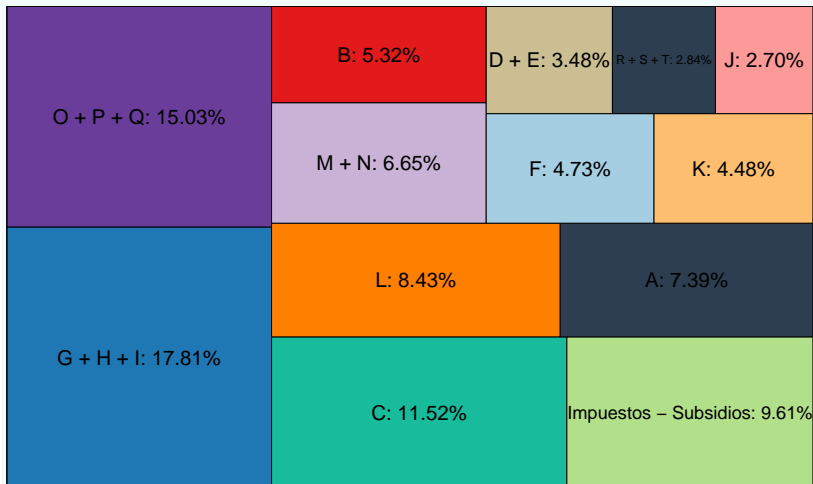
Source: DANE – Cuentas Nacionales Anuales – Retropolación Base 2015 – PIB enfoque de la producción y del gasto a precios corrientes
Update: 2022-06-14

Economics sectors and GDP

Sectors and share in GDP for Colombia

Period: 2021

Observation: Monetary values at current prices are used because of chain volume measures non-additivity



Source: DANE – Cuentas Nacionales Anuales – Retropolación Base 2015 – PIB enfoque de la producción y del gasto a precios corrientes
Update: 2021-06-14

Macroeconomic identity

- Uses that firms, non-profit institutions, government bodies, households and the external sector give to production

$$\begin{aligned}\text{Demand}_t &= \text{Gasto de consumo final individual de los hogares y las ISFLH}_t + \\ &\quad \text{Gasto de consumo final del gobierno general}_t + \\ &\quad \text{Formación bruta de capital}_t + \\ &\quad \text{Exportaciones}_t \\ &= C_t + G_t + I_t + X_t\end{aligned}$$

Macroeconomic identity

- Aggregate value generated by the production units in a territory, plus taxes minus subsidies on products, plus products produced outside the territory offered to the territory

$$\begin{aligned}\text{Supply}_t &= \text{Valor agregado bruto}_t + \\ &\quad \text{Impuestos menos subvenciones sobre los productos}_t + \\ &\quad \text{Importaciones}_t \\ &= \text{Producto interno bruto}_t + \\ &\quad \text{Importaciones}_t \\ &= GDP_t + M_t\end{aligned}$$

Macroeconomic identity

$$\mathbf{Supply}_t = \mathbf{Demand}_t$$

$$GDP_t + M_t = C_t + G_t + I_t + X_t$$

$$GDP_t = (C_t + G_t + I_t) + (X_t - M_t)$$

Macroeconomic identity

Share of GDP components in Colombia

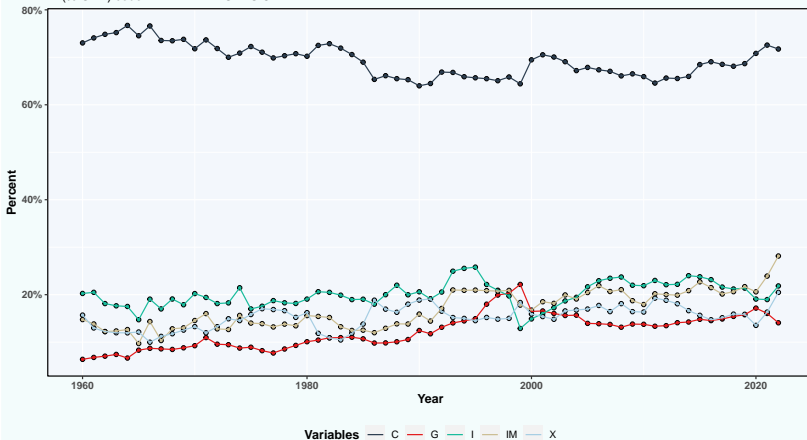
C (% GDP) code WDI: NE.CON.PRVT.CN

G (% GDP) code WDI: NE.CON.GOV.T.CN

I (% GDP) code WDI: NE.GDI.TOTL.CN

X (% GDP) code WDI: NE.EXP.GNFS.CN

M (% GDP) code WDI: NE.IMP.GNFS.CN



Source: World Development Indicators (WDI) – World Bank
Last update date: 2023-06-29

Resource of interest

If you want a summary about the topic of Gross Domestic Product check out¹:

- <https://youtu.be/YXTjJSGWnsE>

¹Banco de la República de Colombia - Cátedras de Macroeconomía y Banca Central

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- To the **Linux kernel community** for allowing me the possibility to use some **Linux distributions** as my main **OS** without paying for a license

References

- ABS. 2003. “Demystifying Chain Volume Measures.” *Western Australian Statistical Indicators*, March, 16–25. [https://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/08CFB1A8C9431C57CA256D030004EE42/\\$File/13675_mar%202003.pdf](https://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/08CFB1A8C9431C57CA256D030004EE42/$File/13675_mar%202003.pdf).
- Cardenas, Mauricio. 2020. *Introducción a La Economía Colombiana*. 4th ed. Alfaomega.
- DANE. 2020. “Clasificación Industrial Internacional Uniforme de Todas Las Actividades Económicas Revisión 4 Adaptada Para Colombia.” https://www.dane.gov.co/files/sen/nomenclatura/ciiu/CIIU_Rev_4_AC2020.pdf.