Production and Income I

Luis Francisco Gomez Lopez

2023-01-10 16:21:05

Contents

- Please Read Me
- Purpose
- Gross Domestic Product (GDP)
- Economic Growth
- 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)

Gross Domestic Product (GDP)

- What is? (Lequiller and Blades 2014, p 19)
  - **Product**: means that we are trying to measure production without double counting
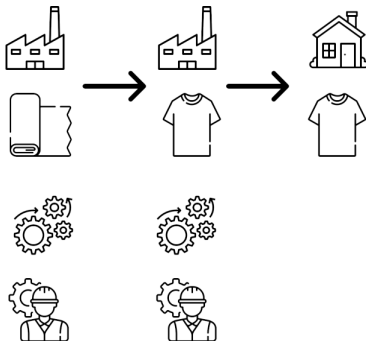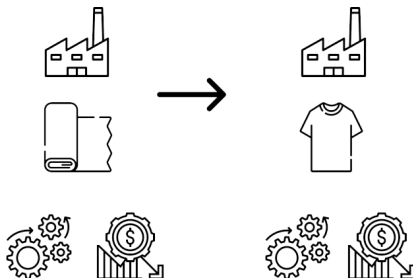
Gross Domestic Product (GDP)

- What is? (Lequiller and Blades 2014, p 19)
  - **Domestic**: means that the production to be taken into account is the one that is carried within a certain territory clearly delimited

Gross Domestic Product (GDP)

- What is? (Lequiller and Blades 2014, p 19)
  - **Gross**: means that depreciation is not deducted (in economy it is called consumption of fixed capital). In other words, the decrease in the value of the assets used in the production process due to physical deterioration, foreseeable wear or accidental damage is not deducted

Gross Domestic Product (GDP)

- How is measure?
  - 3 equivalent[1] approaches are used (Lequiller and Blades 2014, p 31)
    - **Output/Production approach**: adding the aggregate value of all the production units in a territory, plus taxes minus subsidies on products
    - **Income approach**: adding all the incomes that are perceived because of the contribution to the production process
    - **Expenditure/Final demand approach**: adding all uses that firms, non-profit institutions, government bodies, households and the external sector give to production
  - Gross Domestic Product is a flow so is measured over a period of time. Usually you can find information about this varible in an monthly, quarterly or yearly periodicity
  - Initially Gross Domestic Product is expressed in **current** Local Currency Units (LCU)

---

[1]In practice, discrepancies may occur

Gross Domestic Product (GDP)

- Output/Production approach (Colombia, Period: 2022-Q3)

Concepto	Miles de Millones - COP[a]
Agricultura, ganadería, caza, silvicultura y pesca	30006
Explotación de minas y canteras	27703
Industrias manufactureras	44914
Suministro de electricidad, gas, vapor y aire acondicionado; Distribución de agua; evacuación y tratamiento de aguas residuales, gestión de desechos y actividades de saneamiento ambiental	12478
Construcción	16603
Comercio al por mayor y al por menor; reparación de vehículos automotores y motocicletas; Transporte y almacenamiento; Alojamiento y servicios de comida	65736
Información y comunicaciones	8963
Actividades financieras y de seguros	14659
Actividades inmobiliarias	26316
Actividades profesionales, científicas y técnicas; Actividades de servicios administrativos y de apoyo	22758
Administración pública y defensa; planes de seguridad social de afiliación obligatoria; Educación; Actividades de atención de la salud humana y de servicios sociales	48564
Actividades artísticas, de entretenimiento y recreación y otras actividades de servicios; Actividades de los hogares individuales en calidad de empleadores; actividades no diferenciadas de los hogares individuales como productores de bienes y servicios para uso propio	12165
Valor agregado bruto	330866
Impuestos menos subvenciones sobre los productos	43003
Producto interno bruto	373869

Source: DANE - Cuentas Nacionales Trimestrales - Producto Interno Bruto desde el enfoque de la producción a precios corrientes - Cuadro 1 Datos originales
Last update: 2022-11-15

[a] Preliminary data at current prices

Gross Domestic Product (GDP)

- Income approach (Colombia, Period: 2022-Q3)

Concepto	Miles de Millones - COP[a]
Remuneración de los asalariados	111152
Impuestos menos subvenciones	48833
Excedente Bruto de Explotación	128222
Ingreso Mixto	85662
Producto Interno Bruto	373869

Source: DANE - Cuentas Nacionales Trimestrales - PIB por Ingreso - S1 Total Economía
Last update: 2022-12-29
[a] Preliminary data at current prices

Gross Domestic Product (GDP)

- Expenditure/Final demand approach (Colombia, Period: 2022-Q3)

Concepto	Miles de Millones - COP[a]
Gasto de consumo final individual de los hogares y las ISFLH[b]	261850
Gasto de consumo final del gobierno general	52432
Formación bruta de capital	93076
Exportaciones	78074
Importaciones	111563
Producto interno bruto	373869

Source: DANE - Cuentas Nacionales Trimestrales - Producto Interno Bruto desde el enfoque del gasto a precios corrientes - Cuadro 1 Datos originales
Last update: 2022-11-15
[a] Preliminary data at current prices
[b] Instituciones sin fines de lucro que sirven a los hogares
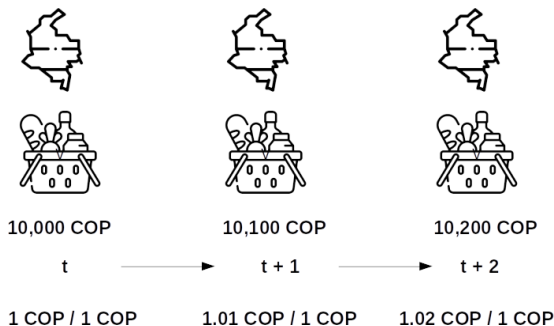
Gross Domestic Product

- What adjustments are applied?[2]
  - **Inflation adjustments**
    - GDP is expressed in **constant** Local Currency Units (LCU)
  - **Season and calendar adjustments**
    - In Colombia this is applied to quarterly GDP (DANE 2018)
  - **Population adjustments**
    - GDP is expressed in per capita terms
  - **Purchase Power Parity (PPP) adjustment**
    - It is used only to make international comparisons and it is led by the International Comparison Program (ICP)

---

[2]For an introduction of the first 3 adjustments check out (Hyndman and Athanasopoulos 2021, chap. 3, Section 3.1 Transformations and adjustments)

Gross Domestic Product

- An inflation adjustment is necessary because an arbitrary quantity of local currency units don't have the same purchase power in different periods

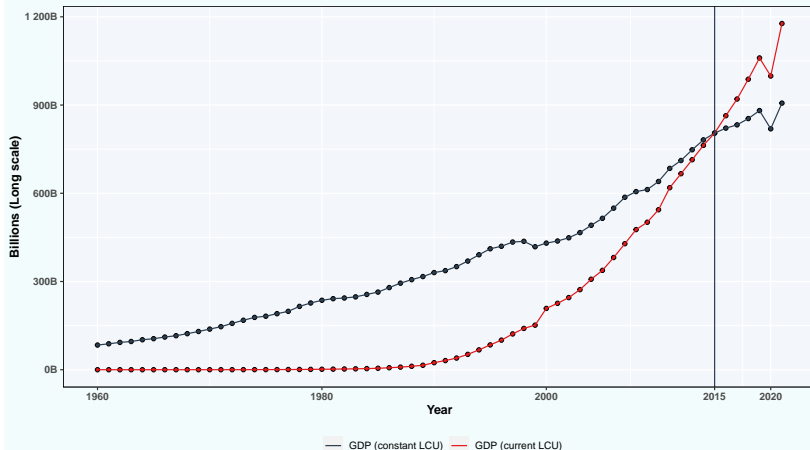| 10,000 COP	10,100 COP	10,200 COP
t	t + 1	t + 2
1 COP / 1 COP	1.01 COP / 1 COP	1.02 COP / 1 COP

Gross Domestic Product

Nominal and Real GDP Colombia
Nominal GDP code WDI: NY.GDP.MKTP.CN
Nominal GDP units: current LCU
Real GDP code WDI: NY.GDP.MKTP.KN
Real GDP units: constant LCU Base Year 2015

GDP (constant LCU) — GDP (current LCU)

Source: World Development Indicators (WDI) – World Bank
Last update date: 2022–12–22

Gross Domestic Product

- Some countries have more population than others so they can produce more. Therefore it is necessary to express the GDP per inhabitant
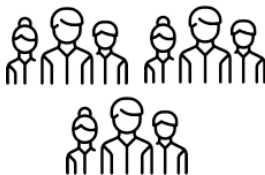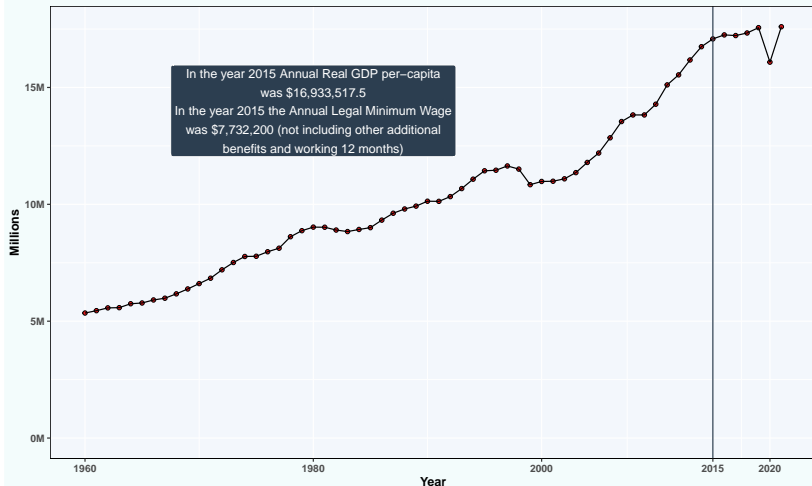
Gross Domestic Product

Real GDP per–capita Colombia
Variable code WDI: NY.GDP.PCAP.KN
Variable units: constant LCU Base Year 2015

In the year 2015 Annual Real GDP per–capita was $16,933,517.5
In the year 2015 the Annual Legal Minimum Wage was $7,732,200 (not including other additional benefits and working 12 months)

Source: World Development Indicators (WDI) – World Bank
Last update date: 2022–12–22

Gross Domestic Product

- Purchasing power parity
  - The amount of products that 1 local currency unit of an economy can buy in another economy
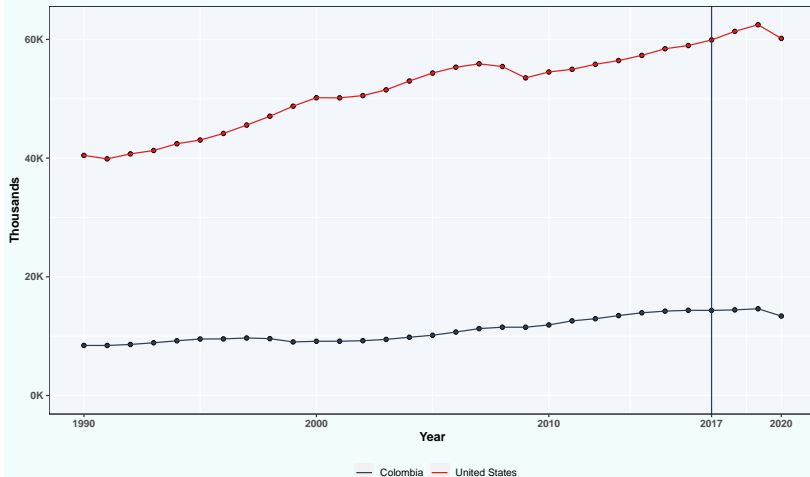

10 USD   10,000 COP

10,000 COP / 10 USD = 1,000 COP / 1 USD

Gross Domestic Product

GDP per–capita purchasing power parity, Colombia and USA
Variable code WDI: NY.GDP.PCAP.KN
Variable units: constant 2017 international USD

Source: World Development Indicators (WDI) – World Bank
Last update date: 2022–12–22

Economic Growth

- The most common metric used to measure economic growth is the annual percent growth of real GDP per capita.
  - If the periodicity of real GDP per capita is **yearly** and we don't want to make international comparisons the formula is:

$$\frac{\text{GDP per capita constant LCU}_t - \text{GDP per capita constant LCU}_{t-1}}{\text{GDP per capita constant LCU}_{t-1}} \times 100$$

Economic Growth

- The most common metric used to measure economic growth is the annual percent growth of real GDP per capita.
  - If the periodicity of real GDP per capita is **quarterly** and we don't want to make international comparisons the formula is:
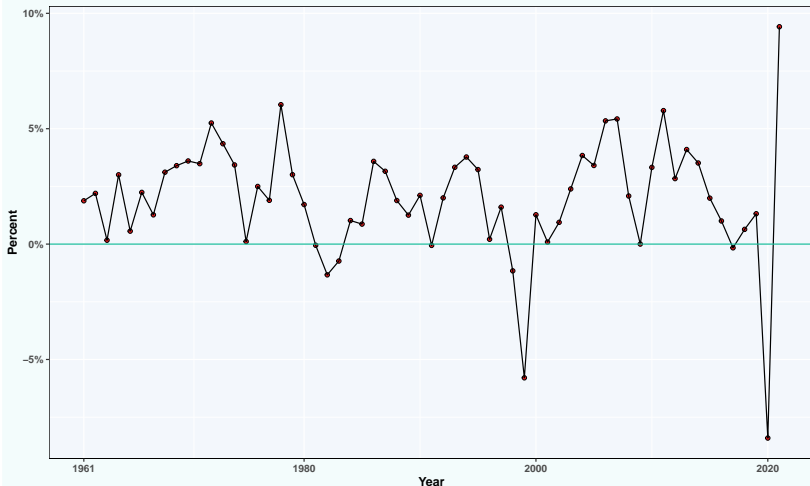
$$\frac{\text{GDP per capita constant LCU}_t - \text{GDP per capita constant LCU}_{t-4}}{\text{GDP per capita constant LCU}_{t-4}} \times 100$$

Economic Growth

Growth real GDP per–capita Colombia
Variable code WDI: NY.GDP.PCAP.KD.ZG
Variable units: annual percent using constant LCU Base Year 2015

Source: World Development Indicators (WDI) – World Bank
Last update date: 2022–12–22

Acknowledgments

- To my family that supports me
- To the taxpayers of Colombia and the **UMNG students** who pay my salary
- To the **Business Science** and **R4DS Online Learning** communities where I learn **R**
- To the **R Core Team**, the creators of **RStudio IDE** and the authors and maintainers of the packages **tidyverse**, **readxl**, **knitr**, **kableExtra**, **tidyquant**, **wbstats** and **tinytex** for allowing me to access these tools without paying for a license
- To the **Linux kernel community** for allowing me the possibility to use some **Linux distributions** as my main **OS** without paying for a license

Acknowledgments

- To the icon designers **Brecris**, **Freepik**, **Iconixar**, **Monkik** and **Eucalyp** from **Flaticon** for letting me use their work in this presentation as a free user

References

Cardenas, Mauricio. 2020. *Introducción a La Economía Colombiana*. 4th ed. Alfaomega.

DANE. 2018. "Cuentas Nacionales Trimestrales Ajuste Estacional." https://www.dane.gov.co/files/investigaciones/boletines/pib/ajuste-estacional-pib.pdf.

Hyndman, Robin John, and George Athanasopoulos. 2021. *Forecasting: Principles and Practice (3rd Ed)*. https://Otexts.com/fpp3/.

Lequiller, François, and Derek Blades. 2014. *Understanding National Accounts: Second Edition*. OECD. https://doi.org/10.1787/9789264214637-en.