Tools for the analysis of international economic relations

Macromagnitudes

International Economics

Facultat d'Economia i Empresa

Universitat Autònoma de Barcelona

February, 2024

Link to updated version

Bibliography:

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  Chapter 1
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Topics

Macroeconomic analysis

Macroeconomic Aggregates

Limitations

Macroeconomic perspective

Let's start considering the overall behavior

- Does not refers to none individual consumer/producer
- It is the aggregation of all the subjects acting in the economy

Macroeconomic agents

National Accounting

- outlines economic agents
- develops accounting concepts
  - allow the description of **operations leading to estimates** of macromagnitudes
- does not take into account individual characteristics
  - what matters is **role played**
    - (e.g., a same individual can be understood as different agents)

🏠 Households

Households and Non-Profit Institutions Serving Households (NPISH)

They are agents whose main function is final consumption. Their main source of income is perceived as owners of the factors of production, which are complemented with transfers received from the Government.

Macroeconomic agents

🏭 Corporations

Non-financial corporations

They are agents whose main function is the production of goods and services. Their main source of income is sales income, but they also receive current and capital transfers from the State.

🏢 Government

General Government

They are agents whose main function is the production of non-market services for the community and to carry out income and wealth redistribution operations. Their main source of income is taxes, social contributions, and other levies, but they also receive transfers, interest, and property income.

Macroeconomic agents

🏛 Financial Sector

Financial corporations

They are agents whose main function is financial intermediation. There are *monetary institutions* (i.e., central banks, commercial banks, savings banks, and others) and *non-monetary institutions* (e.g., investment funds, pension funds, insurance). Their main source of income is the difference between interest received and paid, but they also receive fixed income, fixed rates, and commissions.

🌍 Foreign Sector

Rest of the World

They are the non-resident economic agents in the reference economy. Includes Households, Corporations, Government, and the Financial Sector of the Rest of the World.

Macroeconomic relations

- 🏠 Households
  - Goods and Services market: consumers in the national market and importers in the foreign market
  - Factors market: suppliers of labor, natural resources and capital
  - Financial market: offer savings and demand financing
  - Public sector: receive public provision, pay taxes
- 🏭 Corporations
  - Goods and Services market: producers in the national market and exporters in the foreign market
  - Factors market: demanders of labor, natural resources and capital
  - Financial market: offer savings and demand financing
  - Public sector: receive public subsidies, pay taxes

Macroeconomic relations

- 🏢 Government
  - Goods and Services market: producer in the national market
  - Factors market: demander of labor, natural resources and capital
  - Financial market: offers savings and demands financing
  - Public sector: provides subsidies and benefits, collects taxes
- 🏦 Financial Sector
  - Financial market: demand savings and offer financing
- 🌍 Foreign Sector
  - Goods and Services market: buys exports and sells the imports
  - Factors market: offers and demands labor, natural resources and capital
  - Financial market: offers and demands savings and financing

Equilibrium

Global balance of the economy

- Supply: $S = Y + M$
  - Total goods and services offered are composed of:
    - → Local production (Y)
    - → Imports (M)
- Demand: $D = C + I + G + X$
  - Total goods and services demanded are composed of:
    - → Private consumption (C)
    - → Investment (I)
    - → Public spending (G)
    - → Exports (X)
- Equilibrium: $S = D$
  - $\boxed{Y + M = C + I + G + X}$

From the point of view of income

Let's consider the income that is generated: $Y = LI + GOS + T - S$

- Labor Income (LI)
  - earnings received from working, including wages, salaries, commissions, tips, bonuses, and others
- Gross Operating Surplus (GOS)
  - surplus received by capital owners
- Taxes (T)
  - *indirect* taxes on goods and services
- Subsidies (S)
  - aid to production from the Government

Topics

Macroeconomic analysis

Macroeconomic Aggregates

Limitations

National Accounting

- Allows a systematic record of macroeconomic operations and relationships
  - Very laborious, it takes a long time to prepare
  - They are estimates, they are approximations to reality
  - They are key input for making decisions
- Follows internationally established homogeneous standards

Gross Domestic Product

LA VANGUARDIA

Fundada en 1881 por Don Carlos y Don Bartolomé Godó

SÁBADO, 1 DE AGOSTO DE 2020. NÚMERO 49.899

EMERGENCIA ECONÓMICA

España entra en recesión tras la mayor caída del PIB de la historia

La pandemia ha hundido la economía española un 18,5%, seis puntos más que la media europea, y el descenso anual puede llegar al 22%

ECONOMÍA / P. 28 Y 29

El TSJC corrige a la Generalitat y permite a los bares abrir más horas

Una nueva resolución judicial vuelve a enmendar la aprobada previamente por el Govern. El TSJC dejó ayer sin efecto la limitación del horario de cierre de los bares, restaurantes y salones recreativos a la una de la madrugada y volvió a dejar vigente el cierre de las discotecas. La Generalitat, por su parte, ya justificaba su medida y recurrirá la decisión. SOCIEDAD / P. 22

31/07/20

1,50 €

sábado 31 de octubre del 2020

el Periódico de Catalunya

sábado 31

LA TASA INTERANUAL SUBE DE -21,5% A -8,7%

PANORAMA • 24 y 25, y editorial

Rebote histórico del PIB ante la segunda ola

España sale de la recesión con un crecimiento económico récord del 16,7% en el tercer trimestre del año

El repunte queda aún por debajo de la cota previa al virus y levanta dudas sobre su mantenimiento

-1,7%

-4,2%

-8,7%

-21,5%

2019 2020

PIB INTERANUAL

31/10/20

Gross Domestic Product

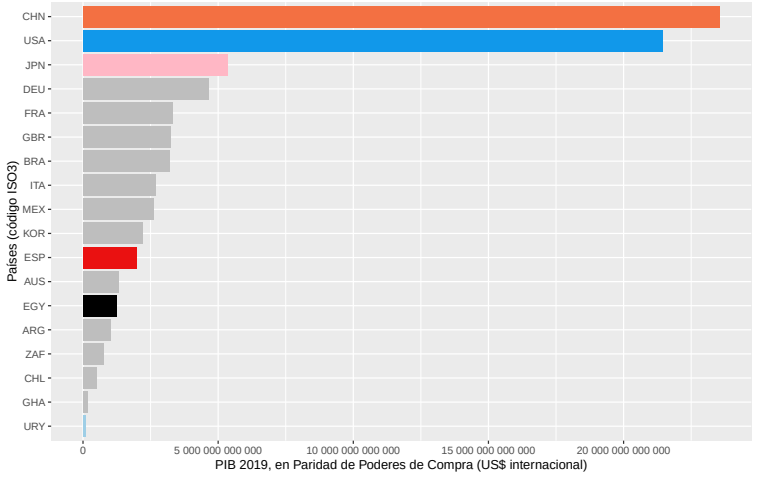
It is the **sum** *(at market prices)* of all **final goods** and **services** produced *within an economy*, in *gross terms*, for a given time

- Domestic: within borders, regardless of producer nationality
- Gross: amortizations of capital assets are considered
- Market prices:considering prices paid for the products: $mp = fc + t - s$

The 3 approaches (to get to the **same**!):

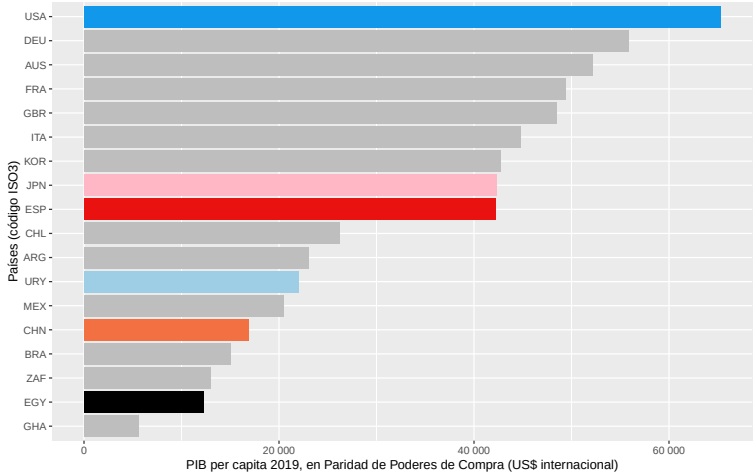
- Output approach:
  - Add up what is produced by different activities
  - $Y = Y_{\text{AGR}} + Y_{\text{IND}} + Y_{\text{CONS}} + Y_{\text{SERV}}$
- Expenditure approach:
  - Add up what was spent by different residents, plus net exports
  - $Y = C + I + G + (X - M)$
- Income approach:
  - Add up the income derived from production
  - $Y = LI + GOS + (T - S)$

GDP 2019, Purchasing Power Parity (international US$)



Source: World Development Indicators - WB

GDP per capita 2019, Purchasing Power Parity (international US$)



Source: World Development Indicators - WB

Supply

Definitions:

Gross Value of Output (GO)

It is the set of goods and services generated with the use of productive factors and intermediate consumption (IC).
We can differentiate between market production (sold in the market at resulting prices) and non-market production (offered free of charge or at a much lower price; e.g., some public goods and services, NPISH, and production dedicated to self-consumption).

Supply

Gross Value Added (GVA)

It is the contribution of the activity of economic agents to the GO at each stage of the production process.
It results from discounting the value of intermediate consumption (IC) used in production. It is the magnitude most used to measure economic activity.

Intermediate Consumption (IC)

It is the value of the goods and services incorporated throughout the entire production process for the production of other final goods and services.
It is necessary to deduct it from the GO to avoid *double counting*.
Capital goods are not included (they are considered GFCF).

Impact of taxation

The activity of the Government affects the value of goods and services before they are acquired by buyers. The value of production at **market prices** does not necessarily coincide with the total value added in its production (basic prices = factor cost).

Not all taxes/subsidies **affect market prices**:

- taxes on **production**:
  - tax productive activity, **regardless of the volume of production**
  - are considered an additional cost
  - are included in the GO at basic prices
  - e.g., activity licenses, driver's license, real estate tax
- taxes on **products**:
  - tax **each unit** produced/distributed/imported
  - increase the value at market prices
  - are not included in the GO at basic prices
  - e.g., VAT, customs duties, taxes on financial operations, tobacco, alcoholic beverages

- taxes on **income and assets**:
  - tax events that **do not directly participate** in the production process
  - do not affect production at basic prices, nor at market prices
  - e.g., income taxes (such as Spanish IRPF), corporate income taxes, wealth taxes
- subsidies on **production**:
  - unrequited aid towards productive activity, **regardless of the volume of production**
  - are included in the GO at basic prices
  - e.g., aid to promote employment, to reduce pollution, for investment in R&D+i, interest bonuses
- subsidies on **products**:
  - unrequited aid towards production/distribution/import for **each unit**
  - reduce the value to market prices
  - are not included in the GO at basic prices
  - e.g., guaranteed price, aid for transportation tickets

Depreciation of productive equipment

Fixed assets suffer deterioration with their use in the production process. The replacement of equipment requires the provision of **depreciation funds**. National accounting expresses the depreciation of fixed assets in terms of *consumption of fixed capital*.

Subtracting depreciation from the production value, the value is obtained in **net terms**.

Not subtracting depreciation from the production value, the value is obtained in **gross terms**.

The calculation of depreciation is complex and imprecise
National accounting usually works with values in gross terms

Domestic and national production

It is important to distinguish the place where it is produced and the status of the agents involved in production.

Domestic production:

- Activity of residents and non-residents, **inside** the territory
- Territory matters

National production:

- Activity of **residents**, inside and outside the territory
- Residence matters

Demand

- Final consumption expenditure

  Expenditure made by residents, inside and outside the territory, in the acquisition of goods and services to satisfy individual and collective needs.

  - **Household consumption and NPISH (C)**:

    Value of goods and services acquired by family economies to be consumed.
    Expenses on home acquisition (considered investment) are not included.

  - **Government consumption (G)**:

    Value of goods and services produced in-house or acquired to meet the supply of public services (e.g., education, health).
    The remunerations of civil servants and other workers in the service of the Government are included.

Demand

Consumption and territory

Consumption can be analyzed by residents and non-residents, inside and outside the territory. Some combinations are particularly interesting.

- Services provision to tourists

  Non-residents, consuming within the territory

  It is considered an export. Not included in final consumption

- Abroad consumption by residents

  Residents, consuming outside the territory

  It is considered an import. It is included in the final consumption of the territory

Demand

- **Investment (I)**

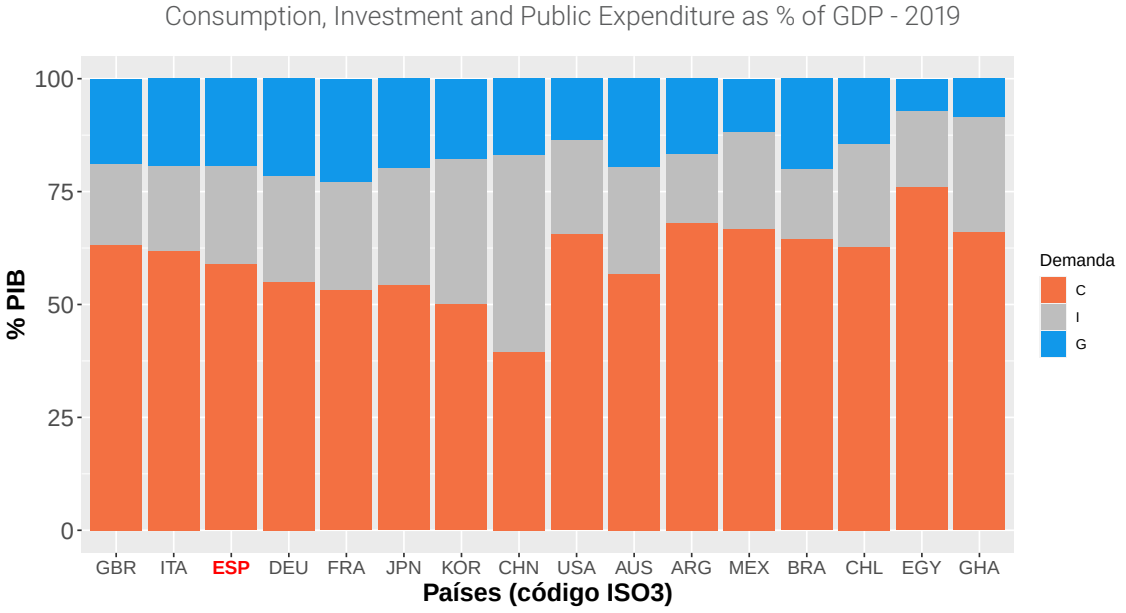
  Expenditure made by resident producers to acquire fixed capital goods, residential construction and inventories.

  - Gross Fixed Capital Formation (GFCF):

    Expenses to acquire capital goods (including research expenses, *software*) in order to use them for more than one year in the production of other goods and services.
    Includes investment intended to cover the depreciation of assets.
    Includes expenses on purchasing new housing for households. It does not include the acquisition of second-hand housing (it is considered consumption).

  - Inventory Variation (IV):

    Difference in value between the beginning and end of a period in raw materials, goods in the process of manufacturing, and finished products stored for later use.


Consumption, Investment and Public Expenditure as % of GDP - 2019
% PIB
100
75
50
25
0
GBR
ITA
ESP
DEU
FRA
JPN
KOR
CHN
USA
AUS
ARG
MEX
BRA
CHL
EGY
GHA
Países (código ISO3)
Demanda
C
I
G
Source: World Bank Indicators. Note: Exports and Imports are excluded

Demand

- Foreign net balance

  Balance resulting from the difference between exports and imports of goods and services.

  - **Exports (X)**:

    Value of domestically produced or imported goods and services, acquired by non-resident agents.
    It is added to the National Demand to reach the Final Demand (FD).

    → Measures the value of goods and services, domestically produced or imported, demanded by residents and non-residents for final consumption and investment.

    → $FD = ND + X = C + I + G + X$

  - **Imports (M)**:

    Value of goods and services produced abroad, acquired by resident agents.
    Subtracted from Final Demand to compute at GDP.

    → $GDP = FD - M = C + I + G + X - M$

Economic cycle

- Boom

  Highest phase of the economic cycle. The economy reaches its highest level of production, using its production factors to their maximum capacity.
  Approximately: GDP growth rates greater than 3%

- Expansion

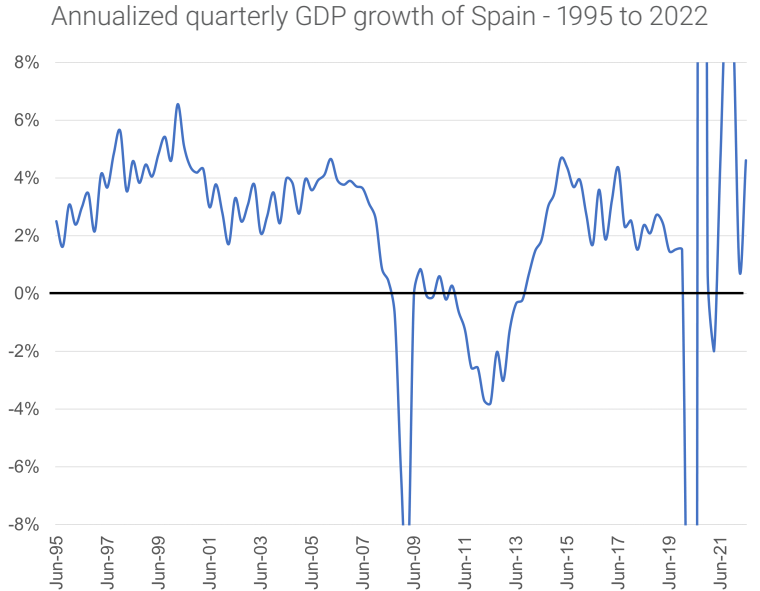
  High phase of the economic cycle. The economy reaches high levels of production, expanding its productive capacity.
  Approximately: positive GDP growth rates, less than 3%

- Stagnations

  Flat phase of the economic cycle. The economy maintains stable productive capacity.
  Approximately: GDP growth rates close to 0%

- Recession

  Low phase of the economic cycle. The economy falls to low levels of production, underutilizing its factors of production.
  Approximately: two consecutive quarters with negative GDP growth rates



Source: Instituto Nacional de Estadística. Note: IPV adjusted for seasonality and calendar.

Income

Primary income

Remunerations to factors and institutions that participate in the production process.

- **Labor Income (LI)**

  Gross salaries and wages. Includes employer social security contributions.

- **Gross Operating Surplus (GOS)**

  Residual of the added value, after the work has been remunerated and the net taxes on production have been paid.
  Rewards the **contribution of capital** to the production process.

  Includes profits, provisions for capital amortization, and other income.

  → When the provisions for capital amortization are deducted, the **Net Operating Surplus (NOS)** is obtained.

- **Mixed Income (MI)**

  Collects the income from producers who **provide capital and labor**, without being able to distinguish the remuneration of one from the other.
  Complementary to the Operating Surplus, they are usually detailed together: GOS/MI

Income

- **Property Income (PI)**

  Set of income received by the **owners** of capital (in the form of financial assets and real assets) as remuneration for their **contribution to the production process of another economic agent**.
  (e.g., interest on financial instruments, dividends, participations, land rents, rents)

- **Net taxes on production, products, and imports**

  These are the remunerations that Government receives for their participation in the production process (e.g., supply and maintenance of infrastructure, public services, markets), **net of the values of the subsidies** granted.
  Includes taxes/subsidies that alter (or not) market prices. Taxes on income and wealth are not included.

Transfers of primary income with the RoW

The international mobility of factors of production implies **flows of remuneration that cross borders**.
Primary Income is usually expressed based on the economic territory ⇒ Internal Primary Income.
To obtain the National Primary Income it is necessary to add the Primary Income received by residents outside the borders, and exclude the Primary Income received by non-residents within the borders.

Income

National Income

It is the sum **(at factor cost)** of all final goods and services produced by **nationals (within and outside an economy)**, in *net terms*, during a given time .

$$NI = NNPfc$$

$$NNPfc = NDPfc + PTRW = GDPmp - (t - s) - amortizations + PTRW$$

Secondary income distribution

It is the redistribution of primary income among the different economic agents, due to the actions of the State and private parties (e.g., donations, inheritances).

- **Current Transfers (CT)**

  Operations without counterparty that **do not remunerate factors of production**, but **alter the disposable income of economic agents**.

  e.g., income taxes, wealth taxes, social security contributions, social benefits.

Income

Disposable Income

It is the income that families have to consume and save.

$$DI = NI + CTRW$$

Added to national income:

- $(+)$ Transfers from the public sector
- $(+)$ Public debt interest
- $(-)$ Retained profits of companies
- $(-)$ Social contributions
- $(-)$ Direct taxes

Income

Application of disposable income

Disposable income can be used in two ways: consumption or savings.

$$DI = FC + GS$$

- **Final Consumption (FC)**

  It is the part of the National Disposable Income applied to final consumption.

- **Gross Savings (GS)**

  It is the part of the National Disposable Income not applied to final consumption.

  It is the item available to an economy to finance investment in real and financial assets necessary for growth.

Income

Capital Resources (KR) come from Gross Savings of the economy and transfers from the Rest of the World.

$$KR = GS + KTRW$$

Capital Resources (KR) finance Gross Capital Formation (GCF). The difference between the two are the Financial Savings (FS).

$$FS = KR - GCF$$

- **Financing capacity**

  When the KR are greater than the GCF, we say that the economy has financing capacity

- **Financing need**

  When the KR are less than the FBC, we say that the economy needs financing

National accounts

The National Accounts follow the conventional form.

Resources are recorded on the right, and **uses are recorded on the left**:

Uses (-)		Resources (+)	
€ XX:	Use A	Resource B	€ XX:
€ XX:	**Balance C**		

Uses (-)		Resources (+)	
		Saldo C	**€ XX:**
€ XX:	Use D	Resource E	€ XX:
€ XX:	**Balance F**		

Example of National Accounts

Uses (-)		Resources (+)	
€ 40:	IC	GO_{bp}	€ 90:
		Net taxes on products	€ 10:
€ 60:	GVA_{mp}		

Uses (-)		Resources (+)	
		GVA_{mp}	**€ 60:**
€ 15:	RA		
€ 5:	Net taxes on production		
€ 10:	Net taxes on products		
€ 30:	GOS/MI		

Prices

How do we measure the value of heterogeneous sets of goods and services?

- We take into account the prices of each of them
  - But, prices change over time without the products themselves changing
  - Example: rental prices

    → We deflate with price indices

Consumer Price Index (CPI)

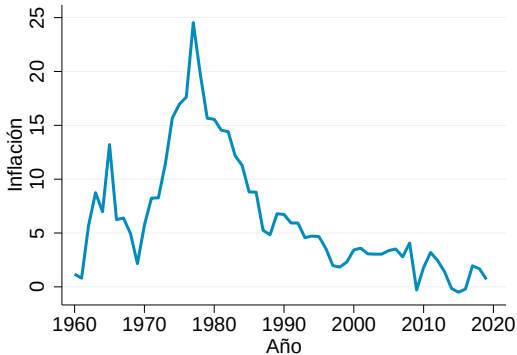
Expresses the price level in relation to the cost of a given consumption basket, which represents the average consumption of residents

GDP deflator

Expresses the price level in relation to the basket of goods/services produced by the country

- How is the CPI prepared?
  1. A representative consumption basket of the residents is selected
  2. The prices of the products that comprise it are surveyed
  3. A weighted average is created
  4. Periodically, the prices of the products are surveyed again
  5. The weighted average is updated
- Inflation:
  - Measures the percentage variation in a price index
  - Normally, we refer to the **annual** variation of the **CPI**

Inflation per year, in Spain

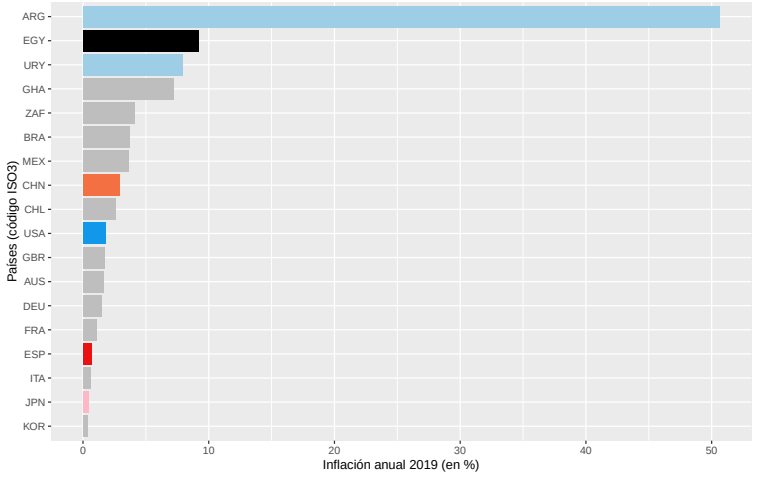


What does it imply?

If I pay 400 €/, for rent:

Decade	Inflation	New Price
1980s	14%	456
2010s	1%	404

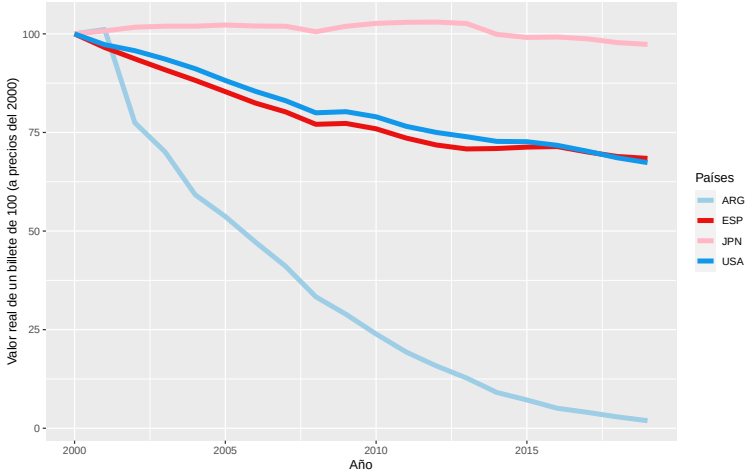
Annual Inflation 2019 (in %)



Source: World Development Indicators - WB

Which bill/coin has retained the greatest value since 2000?

Currency value (since 2000)



Source: World Development Indicators - WB

Topics

Macroeconomic analysis

Macroeconomic Aggregates

Limitations

Macroeconomic aggregates are very useful,

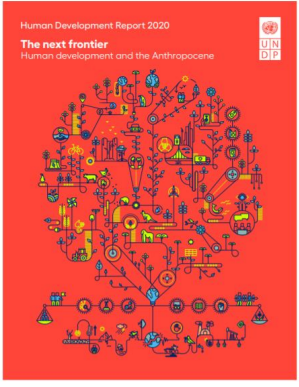
but there are aspects that **traditional indicators do not adequately cover**:

- Work within homes
  - → Examples: care, self-consumption
- Non-monetary transactions
  - → Examples: volunteering, clandestinity
- Unpaid use of natural resources
  - → Examples: maritime, air space
- Wellbeing
  - → Examples: opportunities, quality of life

There are indicators that address these issues

(prepared by academics and different organizations)

Examples



The 2020 Human Development Report

ELSEVIER

Journal of Transport Geography
Volume 15, Issue 2, March 2007, Pages 83-93

Major environmental impacts of European tourist transport

Paul Peeters [a], Eckhard Szimba [b], Marco Duijnisveld [c]

Routledge
Taylor & Francis Group

Applied Economics

ISSN: 0003-6846 (Print) 1466-4283 (Online) Journal homepage: https://www.tandfonline.com/loi/raec20

GDP and the value of family caretaking: how much does Europe care?

Gianna C. Giannelli , Lucia Mangiavacchi & Luca Piccoli

ELSEVIER

Ecosystem Services
Volume 31, Part C, June 2018, Pages 371-386

Assessing and valuing the recreational ecosystem services of Germany's national parks using travel cost models

Marius Mayer [a], Manuel Woltering [b]

Examples

International Economic Journal
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/riej20

Regional Estimates of the Shadow Economy in Europe

Egle Tafenau [a] , Helmut Herwartz [a] & Friedrich Schneider [b]
[a] Institute of Statistics and Econometrics , Christian-Albrechts-Universität zu Kiel , Kiel, Germany
[b] Department of Economics , Johannes Kepler University of Linz , Linz, Austria
Published online: 13 Dec 2010.

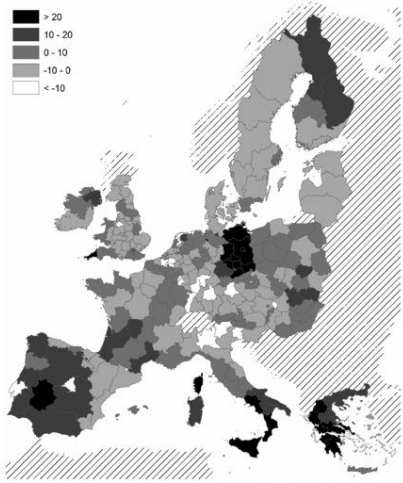


Figure 1. The deviation of the regional shadow economy quotas from the country average (%) in the EU NUTS 2 regions. Based on model 2.