

# Statistics in Economics

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June 30, 2022

# Overview



1. Introduction
2. Importance of Statistics in Economy
3. Global Economy Statistics
4. Central Government Debt Statistics With Examples

# Introduction





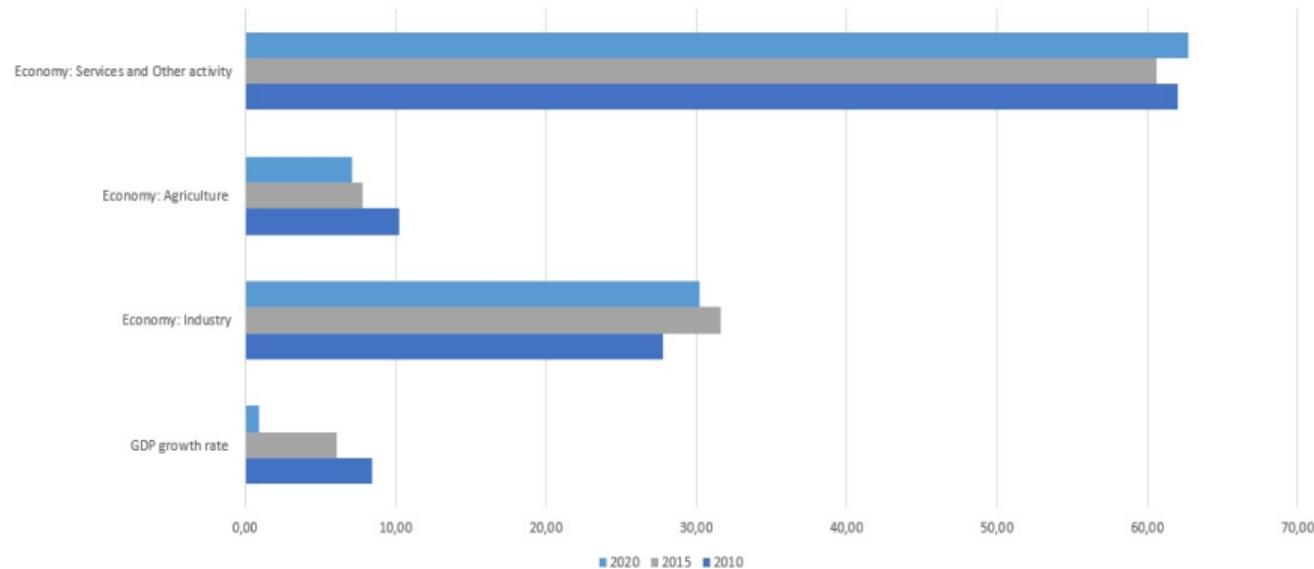
O



United  
Nations



Economic indicators	2010	2015	2021
GDP: Gross domestic product (million current US\$)	776 967	864 314	761 426 <sup>b</sup>
GDP growth rate (annual %, const. 2015 prices)	8.4	6.1	0.9 <sup>b</sup>
GDP per capita (current US\$)	10 742.4	11 006.2	9 126.6 <sup>b</sup>
Economy: Agriculture <sup>a</sup> (% of Gross Value Added)	10.2	7.8	7.1 <sup>b</sup>
Economy: Industry <sup>a,b</sup> (% of Gross Value Added)	27.8	31.6	30.2 <sup>b</sup>
Economy: Services and other activity <sup>b</sup> (% of GVA)	62	60.6	62.7 <sup>b</sup>
Employment in agriculture (% of employed)	23.7	20.4	18 <sup>d</sup>
Employment in industry (% of employed)	26.2	27.2	26.1 <sup>d</sup>
Employment in services (% of employed)	50.1	52.4	55.9 <sup>d</sup>
Unemployment <sup>i</sup> (% of labour force)	10.7	10.2	12.9 <sup>d</sup>
Labour force participation rate <sup>j</sup> (female/male pop. %)	27.0 / 69.6	31.4 / 71.6	33.9 / 72.4 <sup>d</sup>
CPI: Consumer Price Index (2010=100)	100 <sup>j</sup>	146 <sup>j</sup>	263 <sup>d</sup>
Agricultural production index (2014-2016=100)	86	102	111 <sup>b</sup>
International trade: exports (million current US\$)	113 883	143 850	169 658 <sup>d</sup>
International trade: imports (million current US\$)	185 544	207 207	219 514 <sup>d</sup>
International trade: balance (million current US\$)	- 71 661	- 63 356	- 49 856 <sup>d</sup>
Balance of payments, current account (million US\$)	- 44 620	- 27 314	- 37 315 <sup>d</sup>



# The GLOBE of ECONOMIC COMPLEXITY

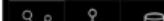
\$1 trillion of world trade  
one dot = \$100 million of exports

► Play Intro

Select a country



Globe view



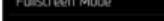
Map view



Country Stacks



3d product  
space



Product  
Space



Product  
Stacks

About

Fullscreen Mode

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High contrast

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## THE ATLAS OF ECONOMIC COMPLEXITY

Click to view more exports  
Filter by product category

Animal & Animal  
Products

Vegetable Products

Foodstuffs

Mineral Products

Chemicals & Allied  
Industries

Plastics & Rubbers

Leathers and Furs

Wood & Wood  
Products

Textiles

Footwear &  
Headgear

Stone & Glass

Metals

Machinery &  
Electrics

Transportation

Miscellaneous



# the GLOBE of ECONOMIC COMPLEXITY

\$15 trillion of world trade  
one dot = \$100 million of exports

► Play Intro

Select a country



Globe view



Map view



Country Stacks



3d product  
space



Product  
Space



Product  
Stacks

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## THE ATLAS OF ECONOMIC COMPLEXITY

CLICK TO VIEW MORE EXPORTS  
STICK BY PRODUCT CATEGORY

Animal & Animal  
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Electrical

Transportation

Miscellaneous



Center for International Development  
at Harvard University



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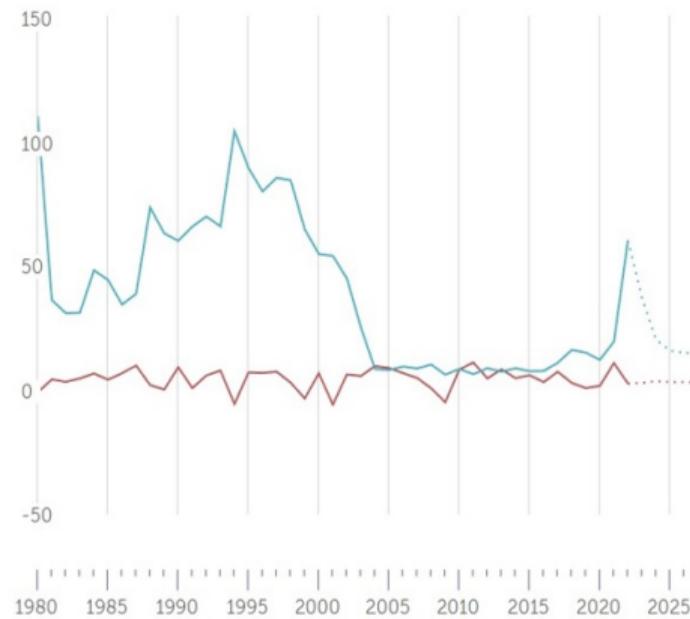
SELECT AN INDICATOR

IMF DataMapper, April 2022



Real GDP growth (Annual percent change) 2.7

Inflation rate, average consumer prices (Annual percent change) 60.5



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## OECD Data Collection Programme, Paris June 2022

[www.oecd.org/statistics/data-collection/](http://www.oecd.org/statistics/data-collection/)

Theme	Questionnaire	Transmission date	Submission date	Data frequency	Contact	Committee or body responsible	Description	New Develop
Agriculture and Fisheries	OECD-FAO Agricultural Outlook	October	December	Annual	tad.contact@oecd.org	Committee for Agriculture	To provide an annual update of stat na	
Agriculture and Fisheries	Producer and Consumer Support Estimates in OECD Countries	November	February	Annual	tad.contact@oecd.org	Committee for Agriculture	To collect, process, analyse and pu na	
Agriculture and Fisheries	Marine landings	June/July	August/September	Annual	fish.contact@oecd.org	Fisheries Committee	The database of fisheries and aqua: No change in 21	
Agriculture and Fisheries	Fisheries Employment	June/July	August/September	Annual	fish.contact@oecd.org	Fisheries Committee	The database of fisheries and aqua: No change in 21	
Agriculture and Fisheries	Fishing vessels (only for non EU members)	June/July	August/September	Annual	fish.contact@oecd.org	Fisheries Committee	The database of fisheries and aqua: No change in 21	
Agriculture and Fisheries	Fisheries Support Estimate (FSE)	June/July	August/September	Annual	fish.contact@oecd.org	Fisheries Committee	The database of fisheries and aqua: No change in 21	
Agriculture and Fisheries	Best policies and practices against IUU fishing	June/July	August/September	Biennial	fish.contact@oecd.org	Fisheries Committee	The database of fisheries and aqua: No change in 21	
Agriculture and Fisheries	Fisheries Targets & Thresholds indicator	June/July	August/September	Biennial	fish.contact@oecd.org	Fisheries Committee	The database of fisheries and aqua: No change in 21	
Demography and Population	International Migration	September	November	Annual	migration.contact@oecd.org	Employment, Labour and Social Affairs Comm	Annual monitoring of flows, stocks at On-going data c	
Demography and Population	Population Projections	No regular date exists	No regular date exists	Annual	els.contact@oecd.org	Employment, Labour and Social Affairs Comm	The population datasets present two No new develop	
Demography and Population	Database on Immigrants in OECD (DIOC) and non OECD cou	No regular date exists	(ever No regular date exists (e/ Annual		migration.contact@oecd.org		na	na
Development	DAC statistical collections on development finance statistics: Cr	February	July	Annual	dac.contact@oecd.org	Development Assistance Committee	Provide Members of the Developme	The CRS const
Development	DAC statistical collections on development finance statistics: Off	February	July	Annual	dac.contact@oecd.org	Development Assistance Committee	The Development Assistance Com	There are regul
Development	Survey on Forward Spending Plans	May	July	Annual	DACDataCollection@oecd.org	Development Assistance Committee	The DAC Survey on Forward Spend Given the defin	
Development	Social Institutions and Gender Index 2023	No regular date exists(ever No regular date exists(ev	Quadrennial		DEV.Gender@oecd.org	DEV Governing Board	The 2023 edition of the Social Institu	na
Education and Training	Programme for the International Assessment of Adult Competencies	No regular date exists (ever No regular date exists (e/ Decennial			edu.piaac@oecd.org	Education Policy Committee	PIAAC is designed to i) identify and r	The main data
Education and Training	Education (INES activities)	June/July for UOE question	September/November to	Annual	edu.contact@oecd.org	Education Policy Committee	To produce and publish indicators a	na
Education and Training	Education and Labour market (NES-LSO activities)	February	March	Annual	edu.contact@oecd.org	Education Policy Committee	The INES Network on Labour Marke	na
Education and Training	Education and Earnings (NES-LSO activities)	October	December	Annual	edu.contact@oecd.org	Education Policy Committee	The INES Network on Labour Marke	na
Education and Training	Education (NES-NESLI data collections)	October	December	Annual	edu.contact@oecd.org	Economic Policy Committee	Development of indicators on system	na
Education and Training	Teaching and Learning International Survey (TALIS)	No regular date exists	No regular date exists	Quinquennial	talis@oecd.org	Programme for Teaching and Learning Intern	To provide data and indicators on th	Not in 2022, but
Education and Training	Programme for International Student Assessment (PISA)	No regular date exists (ever No regular date exists (e/ Triennial			edu.pisa@oecd.org	Programme for International Student Assessm	The Programme for International St	In 2021 Themati
Energy	Projections: Energy Policies of IEA Countries	Varies from year to year.	Varies from year to year.	Annual	st@iea.org	International Energy Agency Governing Boar	Data on energy energy policies, foc	There is not an
Energy	Monthly electricity	No regular questionnaire to	On the 15th of each mon	Monthly	cea@iea.org	International Energy Agency Governing Boar	This monthly report and dataset pro	There is not an
Energy	Energy efficiency indicators	November	January	Annual	energy.indicators@iea.cna		na	na
Energy	Energy Technology R&D Budgets	October	January	Annual	rdd@iea.org		na	na

## OECD statistical data collection programs



## OECD Data Collection Programme, Paris June 2022

[www.oecd.org/statistics/data-collection/](http://www.oecd.org/statistics/data-collection/)

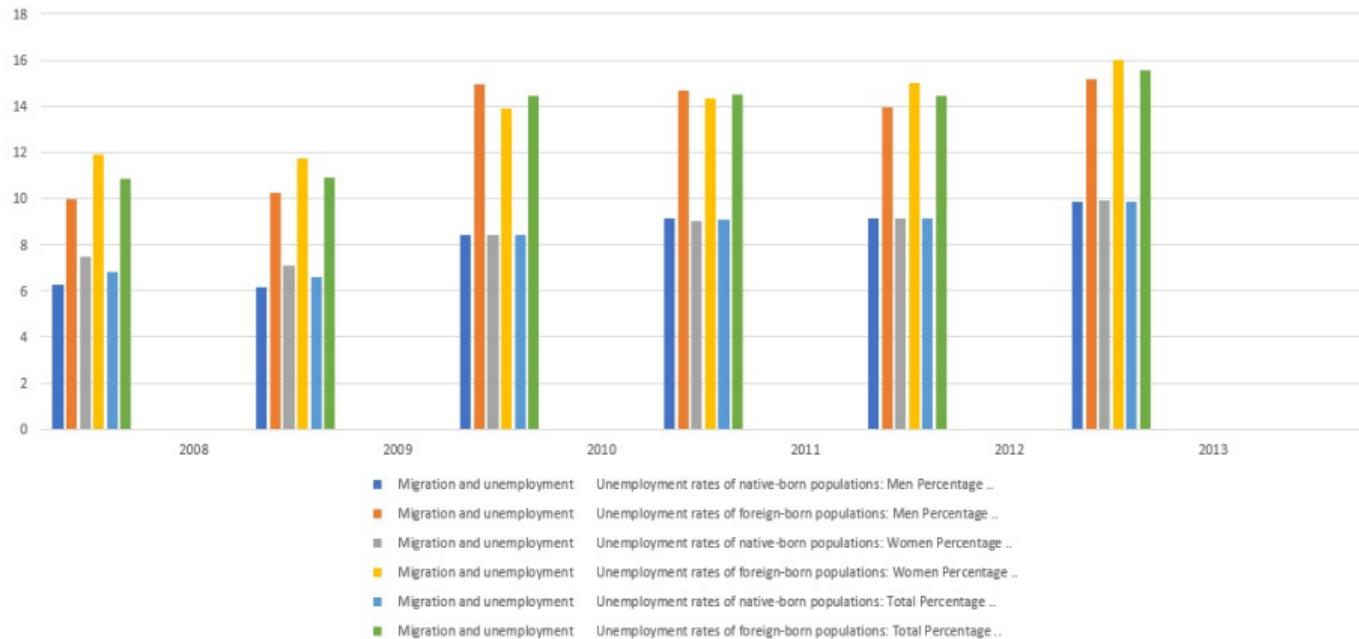
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Energy	Energy Technology R&D Budgets	October	January	Annual	rdd@iea.org		na	na

## OECD statistical data collection programs

			+ Country	European Union (28 countries) ▾							
			+ Year	2006	2007	2008	2009	2010	2011	2012	2013
+ Subject			Unit								
Population and migration	Total population	Population levels	Inhabitants, Thousands	494 004.7	496 044.6	497 979.8	499 523.3	501 079.1	501 928	502 403.3	506 167.4
		Population growth rates	Growth rate	0.402086	0.4129351	0.3901145	0.3099485	0.3114724	0.169405	(B) 0.09470741	...
		Working age population	Percentage	67.21062	67.19649	67.13107	66.99126	66.85544	66.66082	66.35743	...
	Fertility	Total fertility rates	Children	1.514830199	1.530594811	1.587030655	1.585158476	1.58051297	1.56222021	...	...
		Dependent population	Youth population (under the age of 15)	15.90704	15.77811	15.70038	15.66698	15.65203	15.63408	(B) 15.61987	15.591
		Elderly population (age 65 and over)	Percentage	16.8819	17.02519	17.16855	17.34196	17.49245	17.7072	(B) 18.02298	18.24019
International migration	Immigrant and foreign population	Foreign-born nationals	Percentage	...	...	...	...	...	43.1	...	...
	Migration and employment	Employment rates of native-born population by educational attainment: low	Percentage	...	55.561	...	...	...	...	51.389	...
		Employment rates of native-born population by educational attainment: High	Percentage	...	86.274	...	...	...	...	84.746	...
		Employment rates of native-born population by educational attainment: Total	Percentage	...	72.141	...	...	...	...	71.438	...
	Employment rates of foreign-born population by educational	Percentage	...	57.752	...	...	...	...	53.209	...	...



+ Country		European Union (28 countries) ▾							
+ Year	Unit	2006	2007	2008	2009	2010	2011	2012	2013
		▲▼	▲▼	▲▼	▲▼	▲▼	▲▼	▲▼	▲▼
+ Subject	Unit								
	born population by educational attainment: High								
	Employment rates of foreign-born population by educational attainment: Total	Percentage	..	67.35	..	..	..	..	65.377
Migration and unemployment	Unemployment rates of native-born populations: Men	Percentage	..	6.281	6.178	8.425	9.117	9.131	9.843
	Unemployment rates of foreign-born populations: Men	Percentage	..	9.981	10.251	14.944	14.69	13.975	15.165
	Unemployment rates of native-born populations: Women	Percentage	..	7.494	7.113	8.449	9.026	9.126	9.899
	Unemployment rates of foreign-born populations: Women	Percentage	..	11.898	11.733	13.891	14.34	14.982	16.03
	Unemployment rates of native-born populations: Total	Percentage	..	6.827	6.6	8.436	9.076	9.128	9.868
	Unemployment rates of foreign-born populations: Total	Percentage	..	10.838	10.912	14.468	14.532	14.437	15.561



# Importance of Statistics in Economy

# What is economic statistics?



Economic data or economic statistics are data (quantitative measures) describing an actual economy, past or present.

# In the field of economics, statistics is important for the following reasons:

- 1) Understand the state of the economy using descriptive statistics.
- 2) Spot trends in the economy using data visualizations.
- 3) Quantify the relationship between variables using regression models.
- 4) Forecast trends in the economy.

# Reason 1: Understand the Economy Using Descriptive Statistics

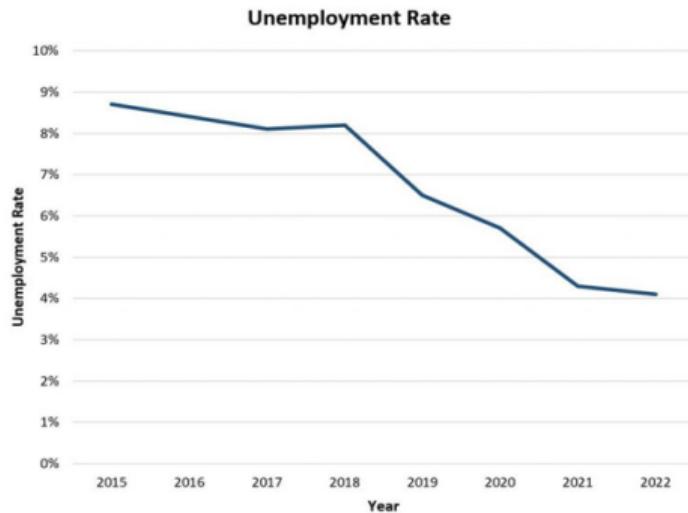
Descriptive statistics are used to describe data.

Mean  
household  
income

Standart  
deviation of  
household  
incomes

Sum of gross  
domestic  
product

Percentage  
change in total  
new jobs



## Reason 2: Spot Trends Using Data Visualization

- These types of charts are often used to help economists spot trends that can help them see if the economy is improving or declining.

## Reason 3: Quantify Relationship Between Variables Using Regression Models

These are models that allow economists to quantify the relationship between one or more predictor variables and a response variable.

They might then build the following multiple linear regression model:

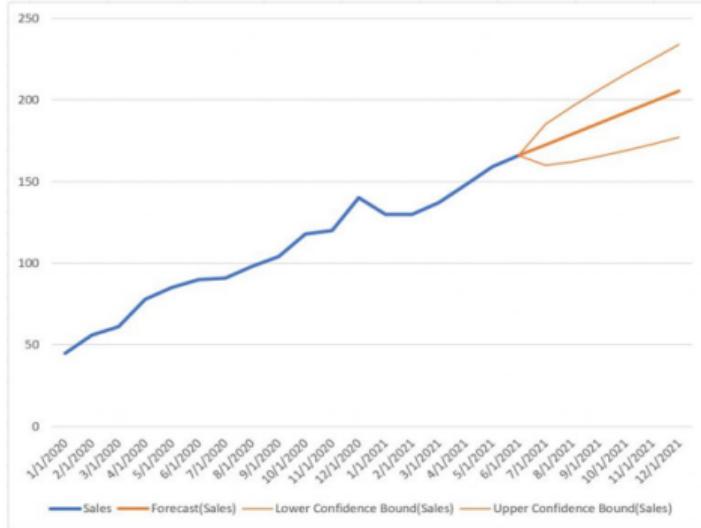
- Income = 35,870.22 +  
1,500.24(years of education)  
+ 400.34(hours spent working per week)



- For each additional year of education, total household income increases by an average of \$1,500.24
- For each additional hour spent working per week, total household income increases by an average of \$400.34

## Reason 4: Forecast Trends in the Economy

- Using this forecast, the economist can predict (with a certain level of confidence) how the economy is likely to perform in the coming months and years.



**Conclusion:** Statistics in economics helps us understand and analyze economic theories and denote correlations between variables such as demand, supply, price, output etc.



# Global Economy Statistics

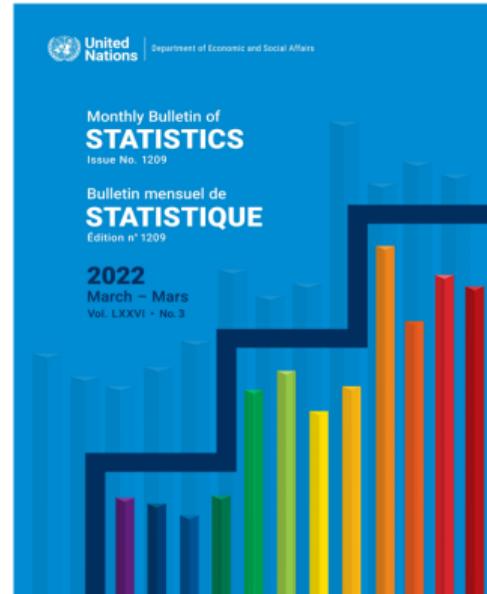
# Quality Characteristics of GDP data

- Relevance
- Accuracy and Reliability
- Accessibility and Clarity
- Interpretability
- Coherence and Comparability
- Timeliness and Punctuality

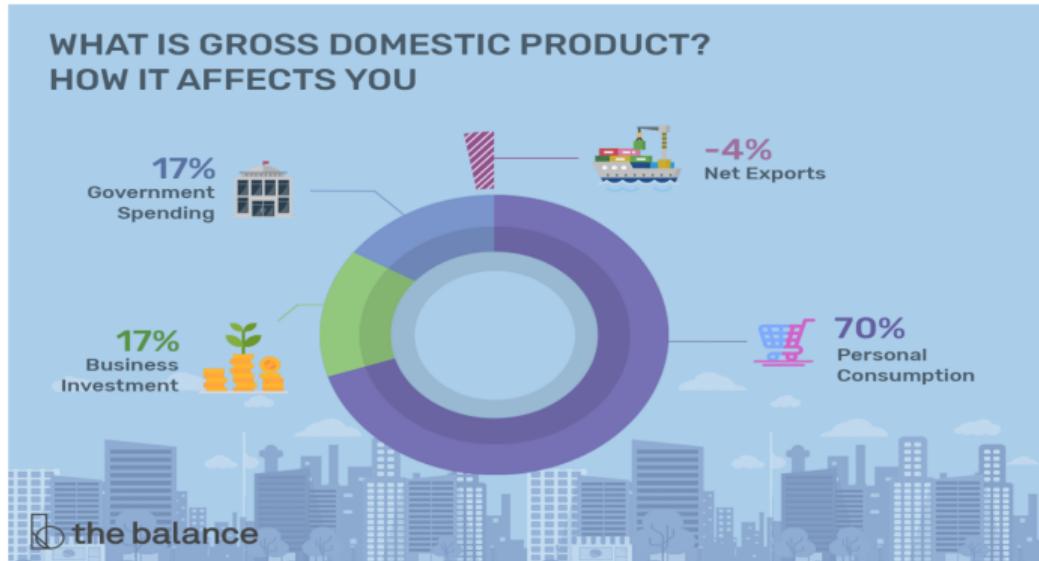


# The main statistical databases other than OECD

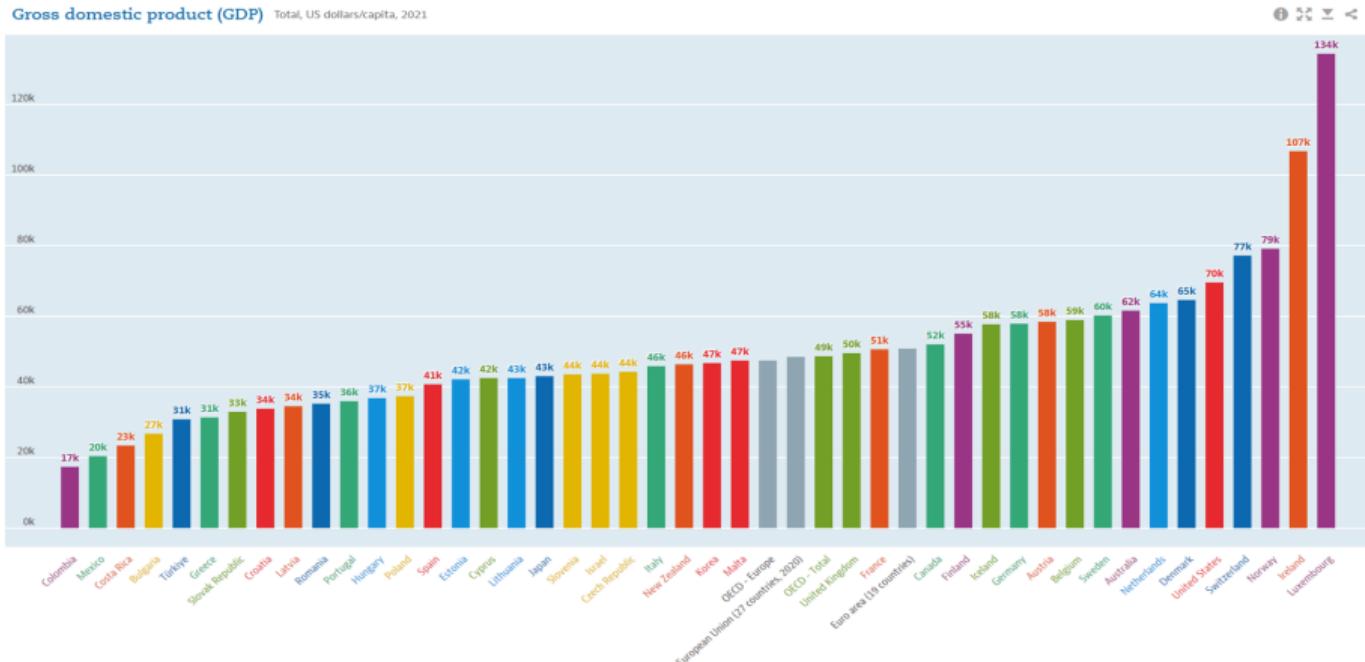
- Millennium Indicators Database (UN)
- Monthly Statistical Bulletin (UN)
- Commodity Trade Statistics Database (UN)
- International Financial Statistics (IMF)
- World Development Indicators (WB)
- New Cronos (Eurostat)
- Euroindicators (Eurostat)
- Structural indicators (Eurostat)
- Regio (Eurostat)
- Monthly Bulletin (ECB)



# What is the GDP?



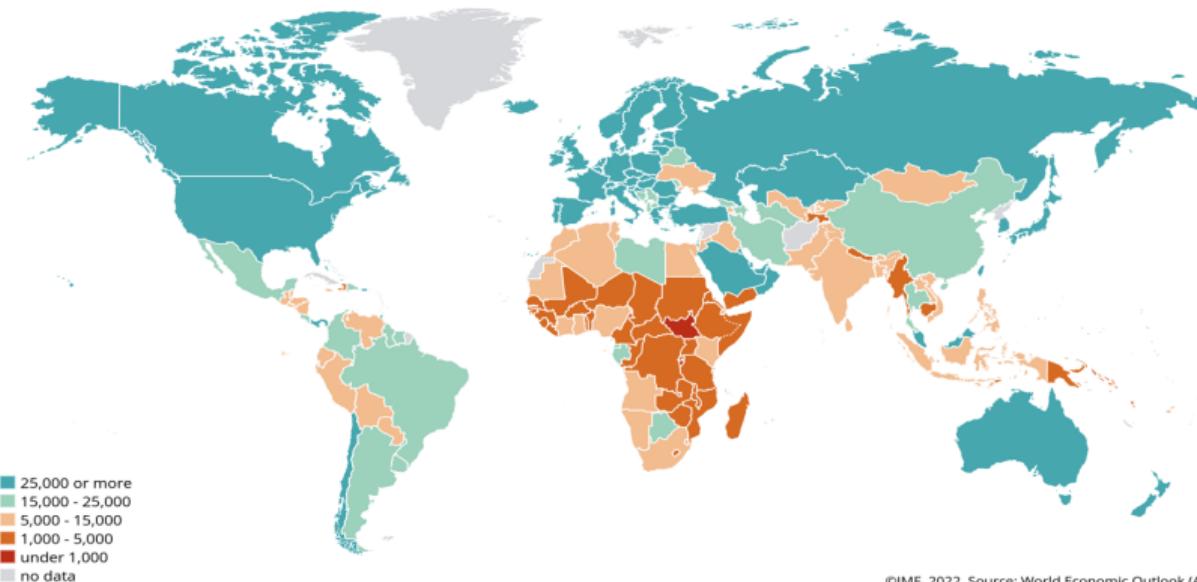
# Global GDP 2021-2022 (US dollars/capita)





# GDP GROWTH (MAP)

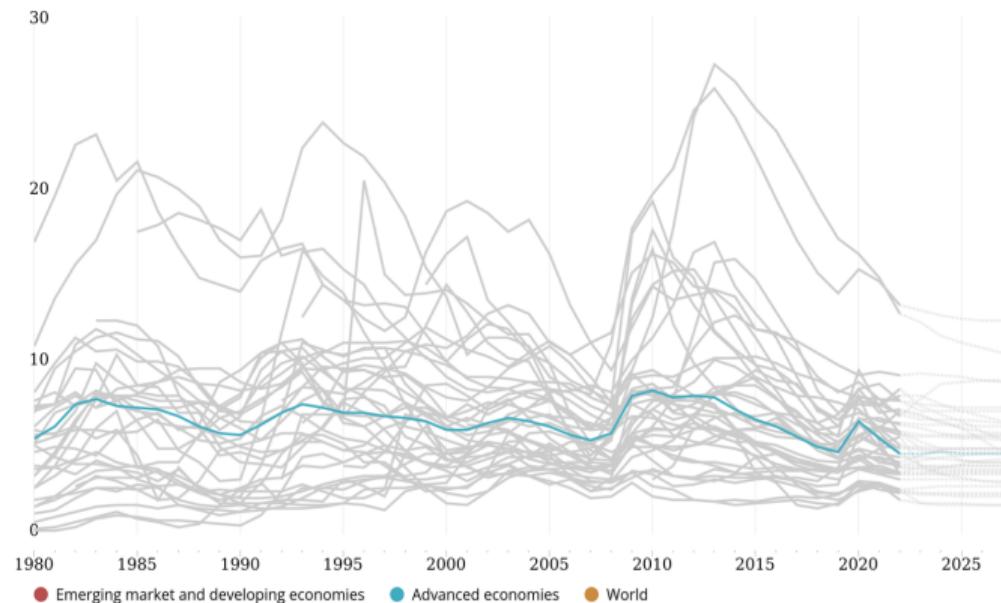
IMF DataMapper GDP per capita, current prices (Purchasing power parity; international dollars per capita, 2021)



©IMF, 2022, Source: World Economic Outlook (April 2022)

IMF DataMapper

Unemployment rate (Percent)

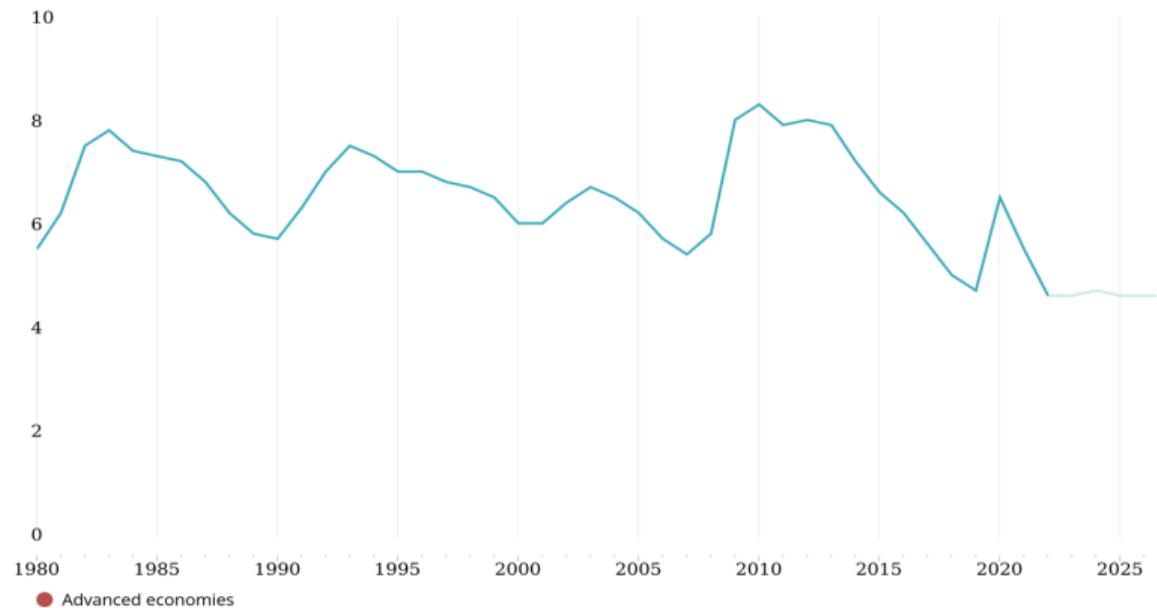


2021 Chart

Advanced Economies: 5.6

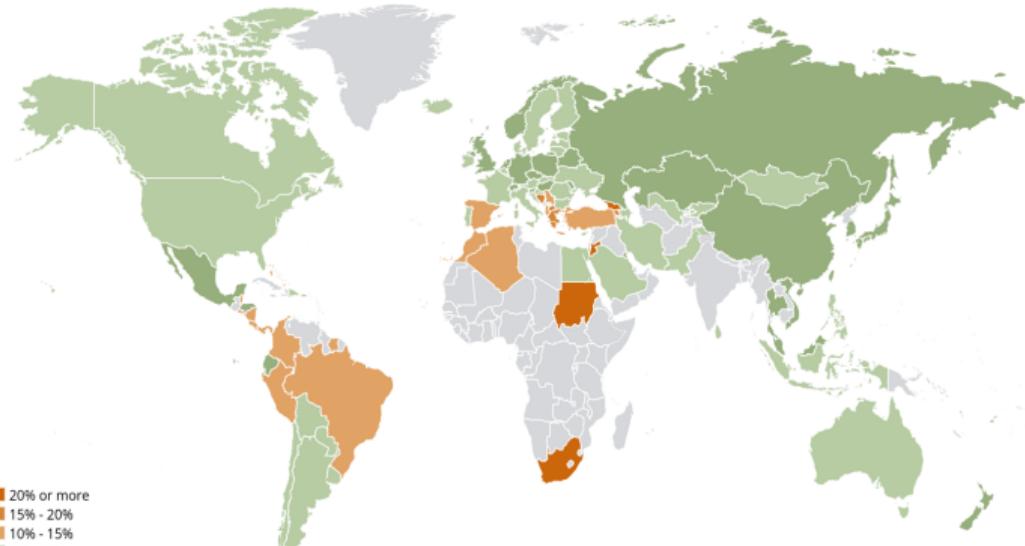
Emerging market and  
developing economies: No  
data

©IMF, 2022, Source: World Economic Outlook (April 2022)



● Advanced economies

©IMF, 2022, Source: World Economic Outlook (April 2022)



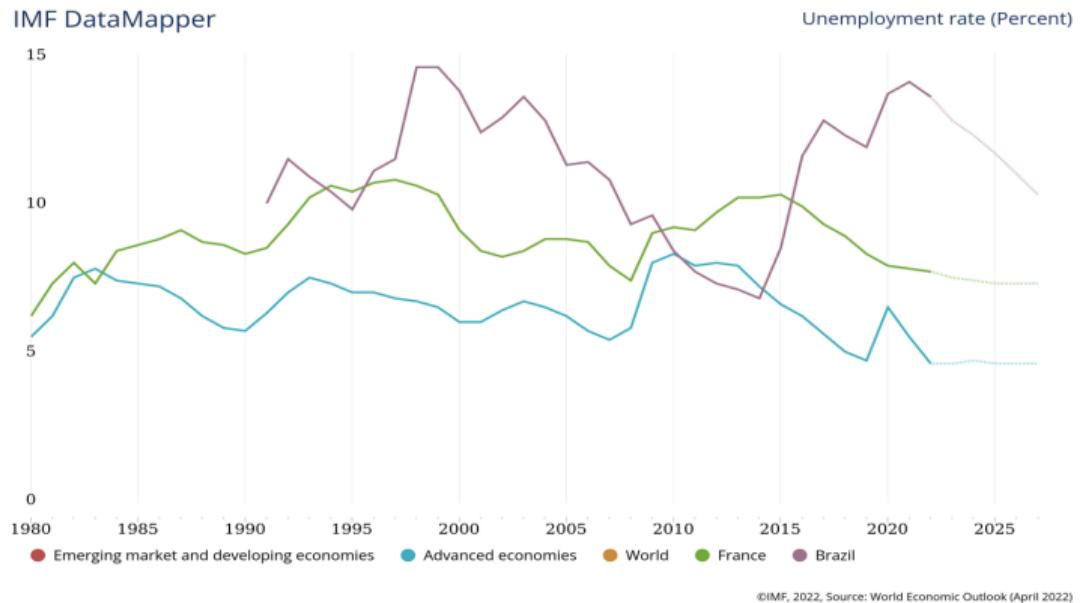
South Africa: 34.2  
Sudan: 28.3

North Macedonia:  
15.7  
Greece: 15  
Brazil: 14.2  
Colombia: 13.7

©IMF, 2022, Source: World Economic Outlook (April 2022)



# Comparison of Brazil and France



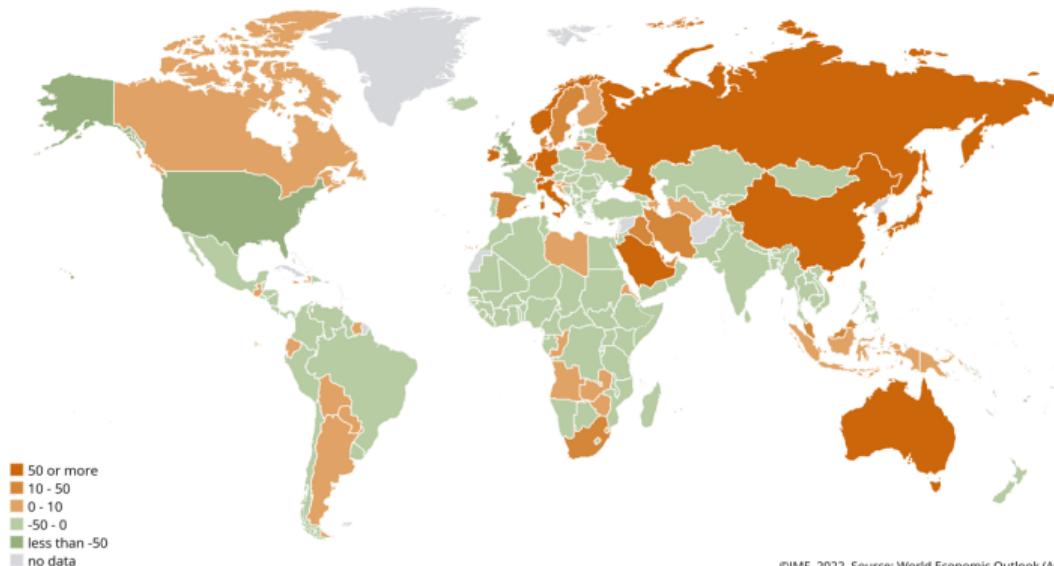
Brazil: 14.2  
France: 7.9



# CURRENT ACCOUNT BALANCE

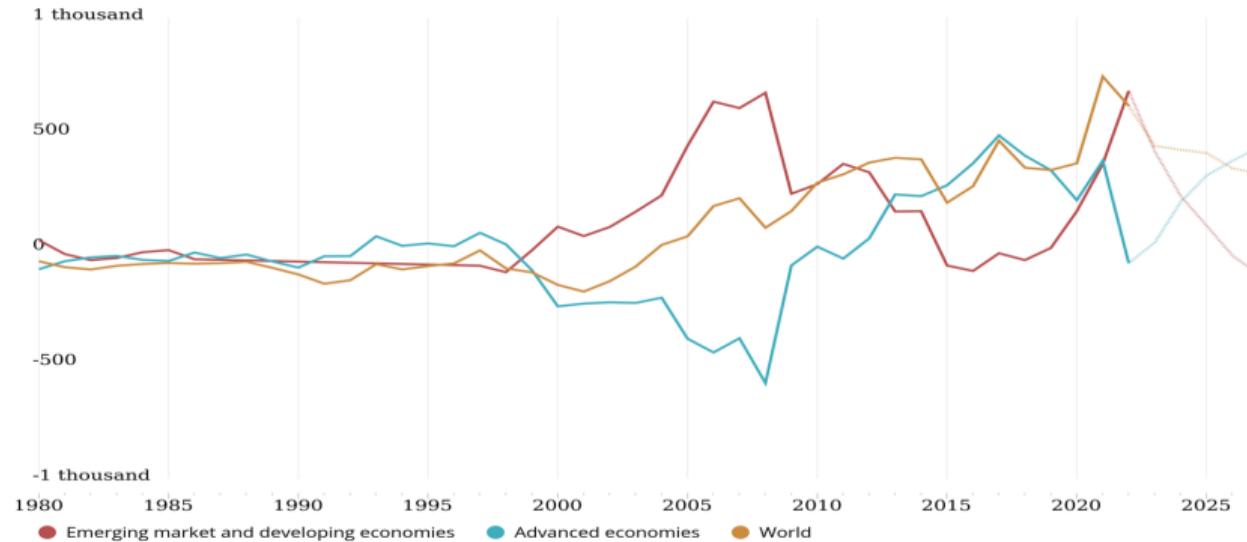
IMF DataMapper

Current account balance U.S. dollars (Billions of U.S. dollars, 2021)



©IMF, 2022, Source: World Economic Outlook (April 2022)

## Current account balance U.S. dollars (Billions of U.S. dollars)



©IMF, 2022, Source: World Economic Outlook (April 2022)

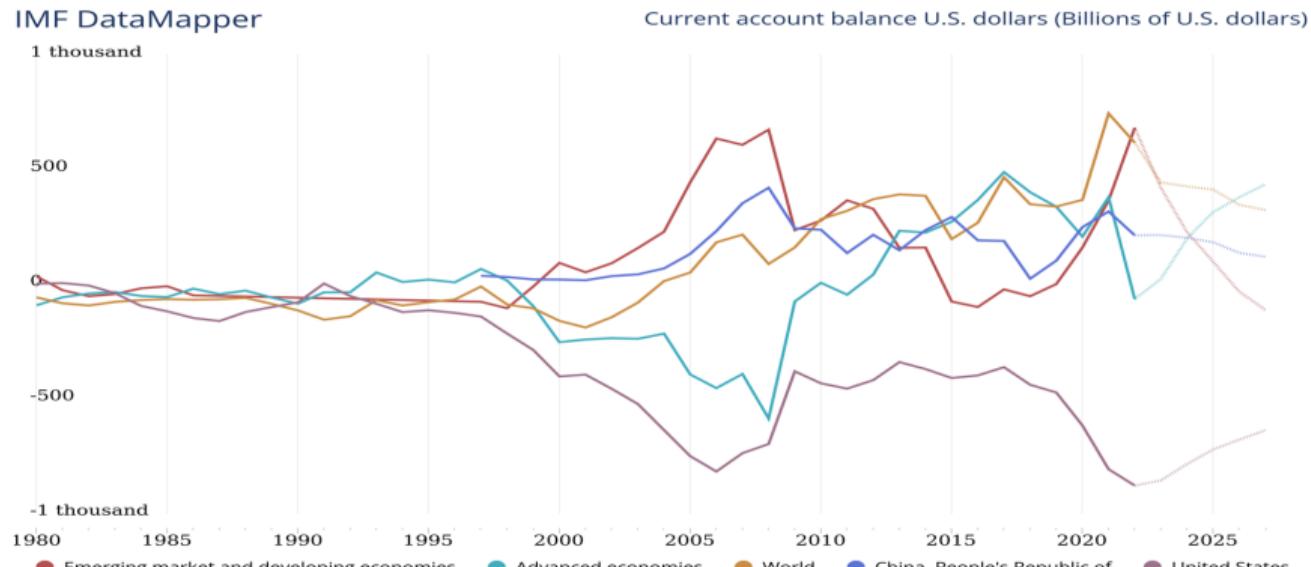
(2021 Data)

- ✖ Emerging market and developing economies +≡ 365.334
- ✖ Advanced economies +≡ 379.292
- ✖ World ≡ 744.626



# Comparison of China And the United States

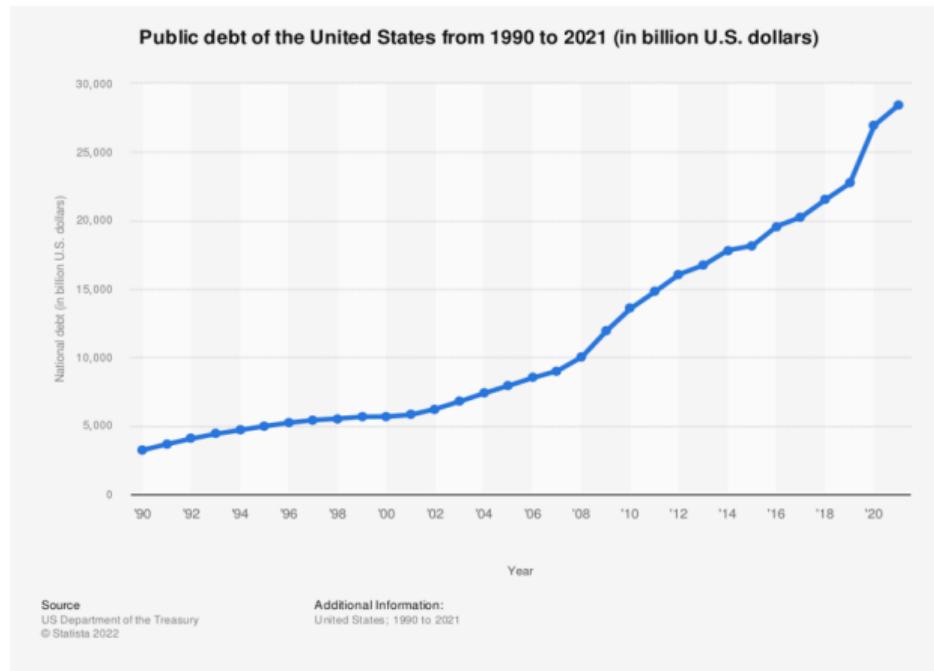
IMF DataMapper



- China, People's Republic of: 317.301
- United States: -806.607

©IMF, 2022, Source: World Economic Outlook (April 2022)

# Central Government Debt Statistics With Examples



**Table 4.4.2 – Central government debt**  
As a percentage of GDP, 1995–2005

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Australia	19.1	19.7	19.0	16.0	14.1	11.7	9.8	8.9	7.8	6.9	6.5
Austria	55.9	56.6	58.7	59.4	61.4	60.4	59.7	59.9	59.9	61.1	61.4
Belgium	113.7	112.6	109.9	105.4	103.6	99.7	99.3	98.2	95.8	93.6	93.2
Canada	56.8	56.3	52.7	50.1	46.7	40.9	39.7	38.1	35.8	32.1	30.4
Czech Republic	10.5	9.4	9.4	9.9	11.2	13.5	14.9	16.4	19.3	21.4	23.6
Denmark	74.9	72.9	69.1	64.0	60.9	54.8	52.0	51.6	49.3	46.9	39.1
Finland	62.5	66.6	64.7	59.5	56.3	48.5	45.3	42.1	44.0	42.6	38.7
France	41.5	44.0	45.6	46.3	47.8	47.4	48.4	49.9	51.9	52.6	53.8
Germany	21.1	22.9	24.3	26.1	34.1	34.1	34.6	36.0	37.7	39.1	40.3
Greece	114.9	118.5	115.3	113.6	113.4	119.3	120.7	119.2	117.3	119.5	119.0
Hungary	83.7	71.0	62.4	60.7	60.0	54.5	51.5	54.5	56.8	56.8	58.5
Iceland	52.3	49.8	46.3	41.0	35.5	34.1	39.6	36.0	33.9	28.6	20.0
Ireland	72.2	64.6	57.2	47.7	44.0	35.0	30.9	27.9	27.0	25.5	23.8
Italy	113.1	113.6	111.0	108.7	106.7	103.6	102.7	99.5	96.6	96.2	98.4
Japan	65.6	69.3	77.0	88.0	97.7	106.2	123.9	137.5	141.2	156.9	163.7
Korea	8.9	8.2	10.3	14.8	16.9	17.4	18.2	18.5	21.9	25.2	29.6
Luxembourg	2.6	3.4	3.7	4.1	3.5	3.2	3.1	2.7	1.7	1.5	0.9
Mexico	40.8	31.1	25.7	27.8	25.6	23.2	22.5	24.0	24.2	23.0	22.4
Netherlands	57.1	56.1	53.0	51.1	48.8	43.9	41.3	41.5	43.0	44.0	42.8
New Zealand	49.7	42.7	36.7	38.4	35.5	32.6	30.4	28.8	27.0	24.2	22.7
Norway	31.0	27.7	24.9	22.4	21.0	19.5	18.3	19.2	21.6	18.7	17.5
Poland	49.6	43.9	43.0	39.5	39.7	35.8	36.4	40.6	45.0	43.7	45.0
Portugal	61.9	61.3	58.0	54.8	55.2	54.1	56.0	58.7	60.6	63.5	69.1
Slovak Republic	19.1	18.5	21.0	22.7	22.8	24.0	36.4	35.4	35.7	39.4	34.2
Spain	52.4	56.1	54.7	52.9	51.7	49.9	46.3	44.0	40.8	39.4	36.5
Sweden	76.9	79.1	75.1	73.4	65.2	58.3	50.2	48.5	49.3	48.3	48.0
Switzerland	22.1	24.2	25.5	28.1	25.7	26.0	25.3	28.4	28.5	28.4	28.5
Turkey	17.5	45.0	44.2	41.7	53.8	50.5	99.7	87.4	78.6	73.5	67.8
United Kingdom	--	--	--	60.8	46.1	42.4	39.8	40.2	39.9	41.6	46.6
United States	49.2	48.0	45.5	42.8	39.4	34.4	33.0	33.8	35.4	36.5	36.5

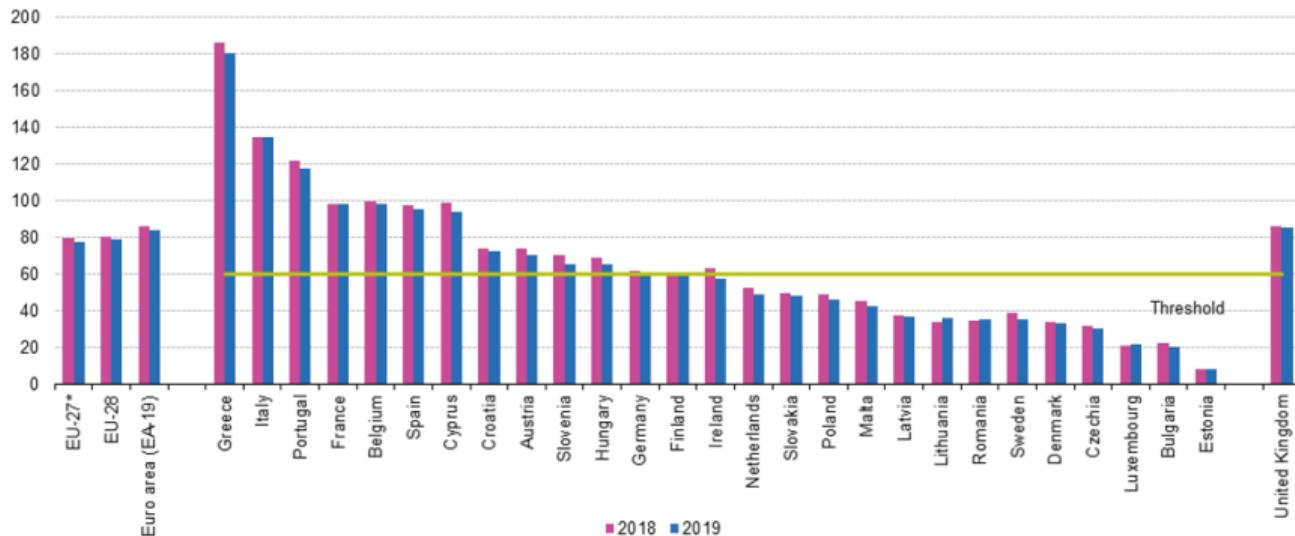
StatLink  <http://dx.doi.org/10.1787/336476116034>

Source: OECD (2006), *Central Government Debt: Statistical Yearbook 1990–2005*, OECD Publishing.

## Key words

- Central government
- Market value
- Nominal value
- Maturity and residual maturity
- Central government debt as a percentage of GDP
- Government-issued bonds as a percentage of total marketable debt
- Marketable central government debt by type of investor

**General government debt, 2018 and 2019 (')**  
 (General government consolidated gross debt, % of GDP)



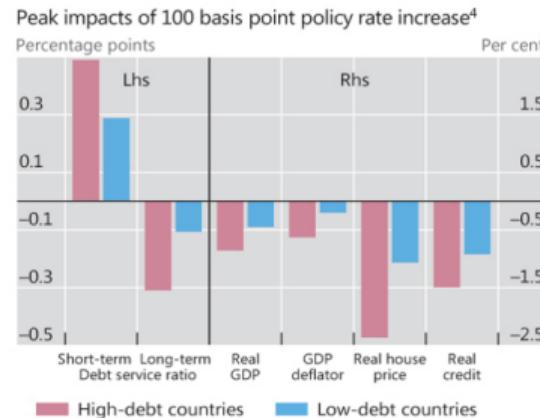
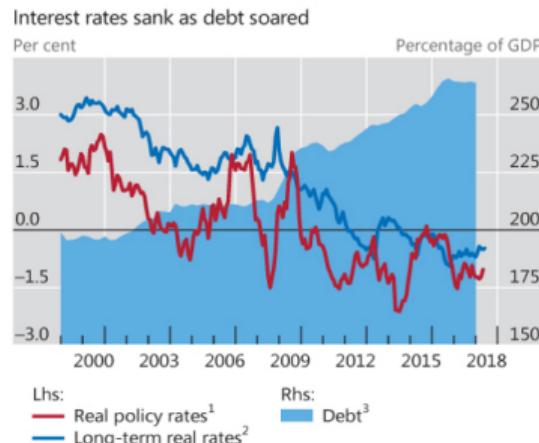
\* from 1 February 2020

(1) Data extracted on 22.10.2020.

Source: Eurostat (gov\_10dd\_edpt1)

## Higher debt raises vulnerabilities

Graph II.8



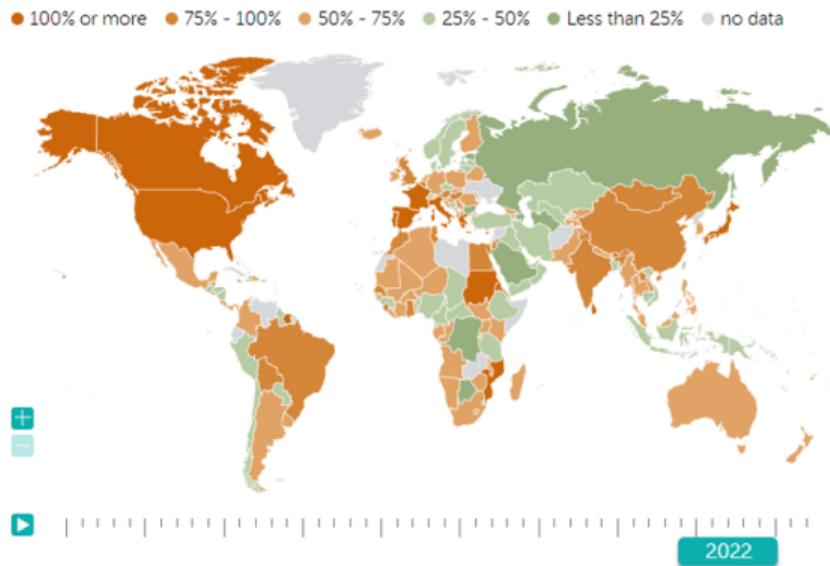
<sup>1</sup> Nominal rate less headline consumer price inflation. Simple average of DE, JP and US. <sup>2</sup> Simple average of index-linked 10-year government bond yields of FR, JP and US. <sup>3</sup> Total credit to non-financial sectors. Weighted average of the G7 economies plus China based on GDP and PPP exchange rates. <sup>4</sup> Peak impacts from impulse responses to a 100 bp shock to the policy rate based on mean group panel VAR estimations using quarterly data for 18 AEs and EMEs. For details, see B Hofmann and G Peersman, "Is there a debt service channel of monetary transmission?", *BIS Quarterly Review*, December 2017.

Sources: Bloomberg; Datastream; national data; BIS calculations.

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## General government gross debt

- Common forms of debt are bank loans, mortgages, and bonds. Gross debt is the total amount of debt a company has at a certain point in time. For example, if a company borrows \$40,000 from a bank and \$10,000 from a family member and has no other debts, the gross debt is \$50,000.



# Conclusion

- Produces economy statistics
- Importance of statistics in economics
- International economy of statistics
- Examples of government debt statistics



THANK YOU FOR YOUR ATTENTION!

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