

# ECON3123

## Macroeconomic Theory I

Tutorial #1: GDP, its uses and limitations

Your TA

**PEGLER Dominic**

E-mail: [ecdjpegler@ust.hk](mailto:ecdjpegler@ust.hk)

Office Room: Rm 6066, LSK Bldg

Zoom id: 515-008-9299

Online Office Hours: 4.30pm - 6.30pm - 6 pm, Tuesday/by appointment

## Today's tutorial

- Gross Domestic Product (GDP): Introduction
- How to calculate GDP – 3 methods
  - Example and exercises
- GDP growth
  - GDP growth around the world: some examples
- GDP growth and economic policy
  - Fiscal Policy
  - Monetary Policy
- Summary

## Gross Domestic Product: Definition

- Gross Domestic Product (GDP):
  - “The value of total goods and services produced in an economy in a given period”
- Usually produced every quarter and aggregated to a yearly figure
- Often a big news story:

Economy / China Economy

### China may adjust 2020 GDP growth target due to coronavirus, government policy adviser says

Analysis **Japanese economy**

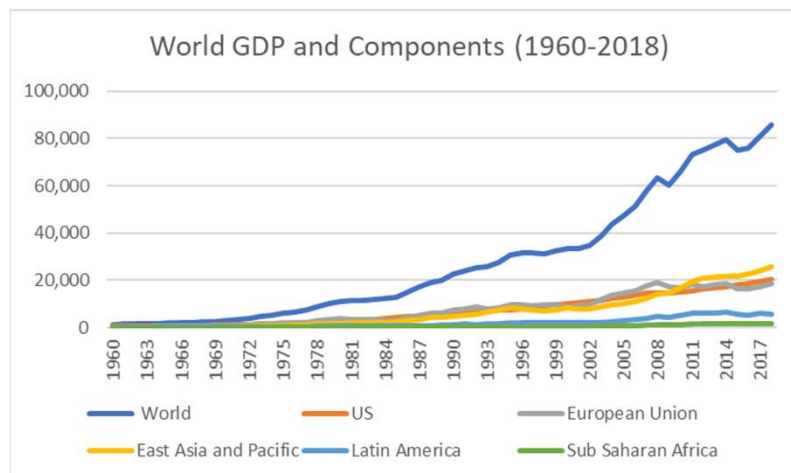
**Abenomics** on trial as Japan teeters on brink of recession

...“three arrows” of **Abenomics**: bold monetary easing, flexible fiscal policy and a reform strategy to revive private investment. Seven years on, he has little to show for it. Following October’s rise in value...

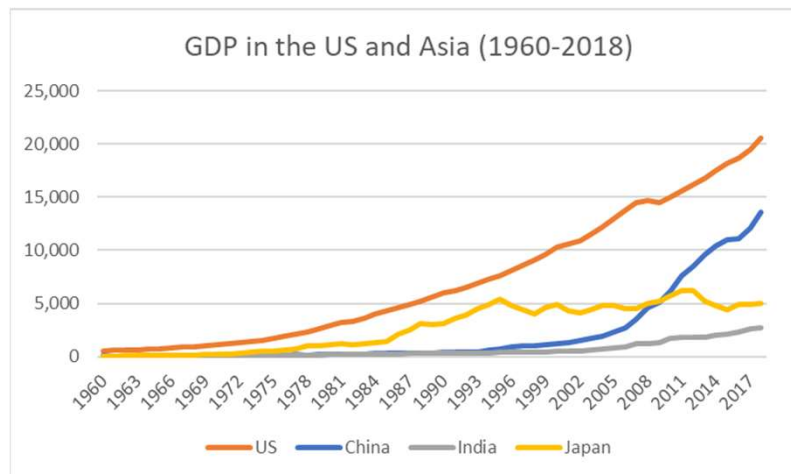
FEBRUARY 18, 2020

Source: Wikipedia, SCMP, Financial Times

## Gross Domestic Product: the world in context



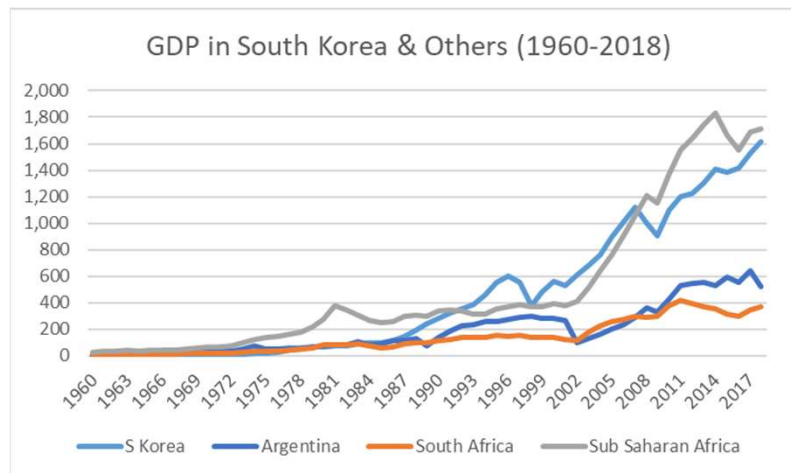
- GDP in the world has increased sharply since 2002
- World GDP fell in 2008/9 and again in 2013/14
  - Rare events
- The world economy is dominated by 3 blocs:
  - US
  - Asia
  - European Union
- Latin America and Sub-Saharan Africa are the world's low GDP regions



- The US is (still) the world's biggest single economy
- Very strong growth in GDP in China since 2005
- Strong performance of Japan 1980-90, but stagnation since
- GDP in India has increased, but from a low base – yet to 'take off' as in China

Source: World Bank

## Gross Domestic Product: the world in context



- Rapid increase in GDP in South Korea since 1980
  - Overtaking Argentina and South Africa
  - Managing to escape the 'Middle Income Trap'
    - A rare case
  - South Korean economy comparable in size to the economy of the whole of Sub-Saharan Africa
- Long periods of stagnation in Argentina and South Africa



- How bad can a country's situation become?
  - The case of Afghanistan
- War and political turmoil since 1980 reflected in stagnation in the economy
- Looks like a recovery since 2012
  - But what's is behind the recovery in GDP?

## Gross Domestic Product: the world in history

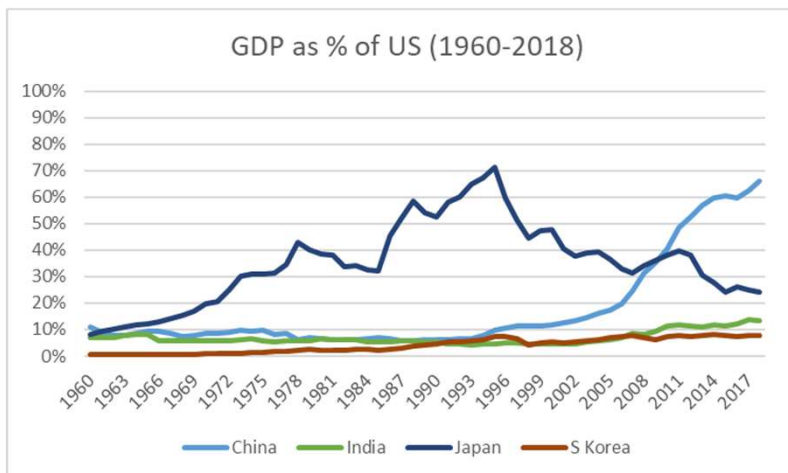
### The World's Largest Economies by GDP 1880-2018

	1880	1920	1960	2000	2018
1	China	US	US	US	US
2	India	China	Soviet Union	China	China
3	US	UK	West Germany	Japan	Japan
4	UK	India	UK	Germany	Germany
5	Russia	Germany	China	India	France
6	Germany	Russia	Japan	Russia	Italy
7	Italy	France	France	France	India
8	France	Italy	India	Italy	Brazil
9	Japan	Japan	Italy	Brazil	Canada
10	Spain	Poland	Brazil	UK	South Korea

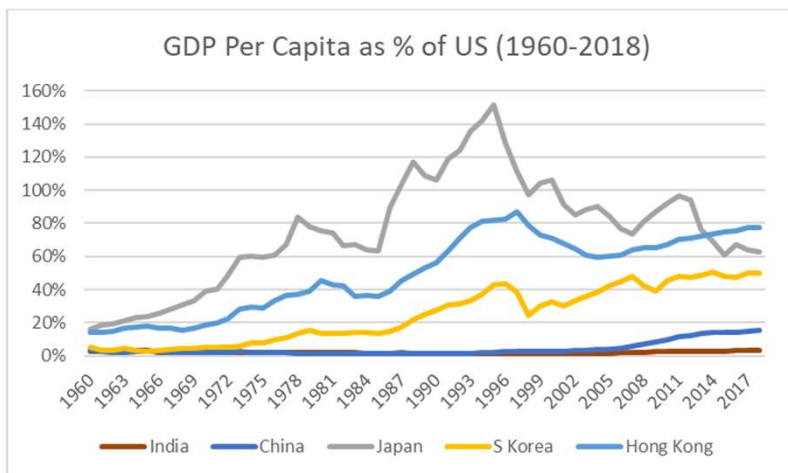
- Rate of industrialization a key determinant of the size of an economy
  - The role of productivity
- Note also the positive relationship between population size and the size of GDP

Source: World Bank, 'Historical Statistics of the World Economy 1-2008 AD'

## Gross Domestic Product: the world in context



- GDP depends on the population of a country
- GDP per capita considers output per person
- China's economy now 66% of the size of the US economy (note: at current USD prices), but GDP per capita 19% of that in the US



Source: World Bank



## Gross Domestic Product: the world in context

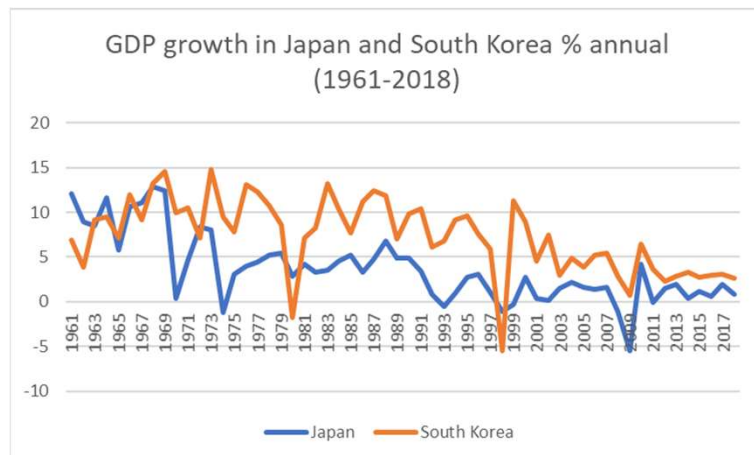
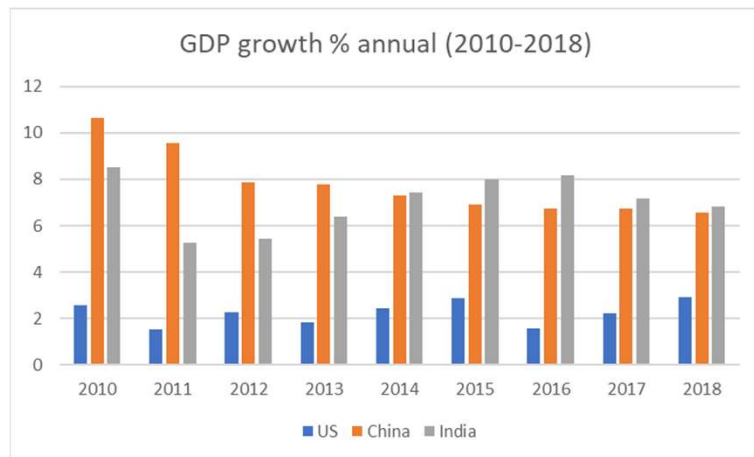
### The Largest and Smallest GDP per Capita Countries (2018)

	Largest		Smallest
1	Monaco	10	New Caledonia
2	Luxembourg	9	Dem. Republic Korea
3	Macao	8	French Polynesia
4	UK	7	San Marino
5	Switzerland	6	South Sudan
6	Norway	5	Sint Maarten (Dutch part
7	Ireland	4	Syria
8	Iceland	3	Venezuela
9	Qatar	2	British Virgin Islands
10	Singapore	1	Virgin Islands

- Note the role of:
  - The service sector
  - Natural resources (esp. oil and gas)
  - War and political instability

Source: World Bank

## GDP growth: what policy makers are really interested in



- Very strong growth record in China and India
  - But from a low base – ‘catch-up’
  - US growth consistently positive since the Financial Crisis
- 
- Growth in Japan and South Korea has slowed in recent years
  - Associated with development to High Income status – growth tends to fall as countries become richer

Source: World Bank

## What GDP does and does not include

“The value of total goods and services produced in an economy in a given period”

Does include:

- All spending on newly produced goods and services
- Spending/production whether good or bad
- Rent and imputed value of housing

Does not include:

- Exchange that does not include money (eg payment in kind), volunteer work
- Work in the family unit (eg housework, caring for children and older relatives)
- Sale of second hand goods
- Economic activity that is not declared to the tax authorities – the ‘black’ economy
- Economic ‘bads’ (pollution, environmental damage)
- Other ‘outputs’ of a society (eg happiness and well-being)
- <https://www.demos.org/research/whats-missing-gdp>

Source: World Bank

What GDP does and does not include

Is dealing in narcotics included in GDP?

What GDP does and does not include

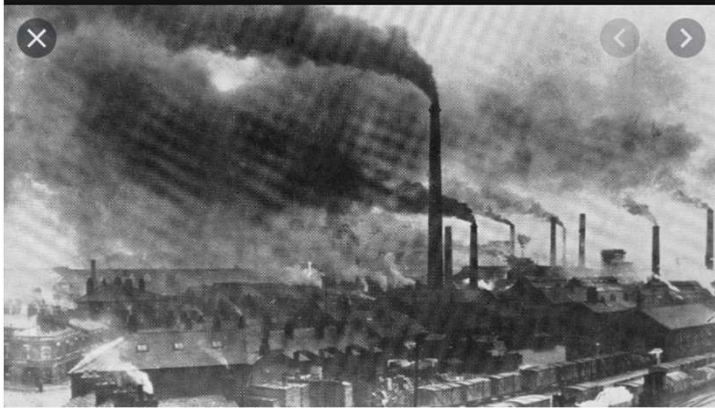
- Is dealing in narcotics included in GDP?
- In some countries, yes!
  - UK
  - France
- But not in others:
  - US (for the time being)

Opinion **FT Magazine**

Should America's GDP data include drug dealing?

<https://beyond-ratings.com/publications/illegal-drugs-in-the-gdp-short-term-gain-but-long-term-loss/>

GDP takes no account of pollution and environmental damage



- Widnes, UK, about 1890
- Production in the chemical industry was growing by at least 10% per year
- But what was the environmental and social cost of the growth?



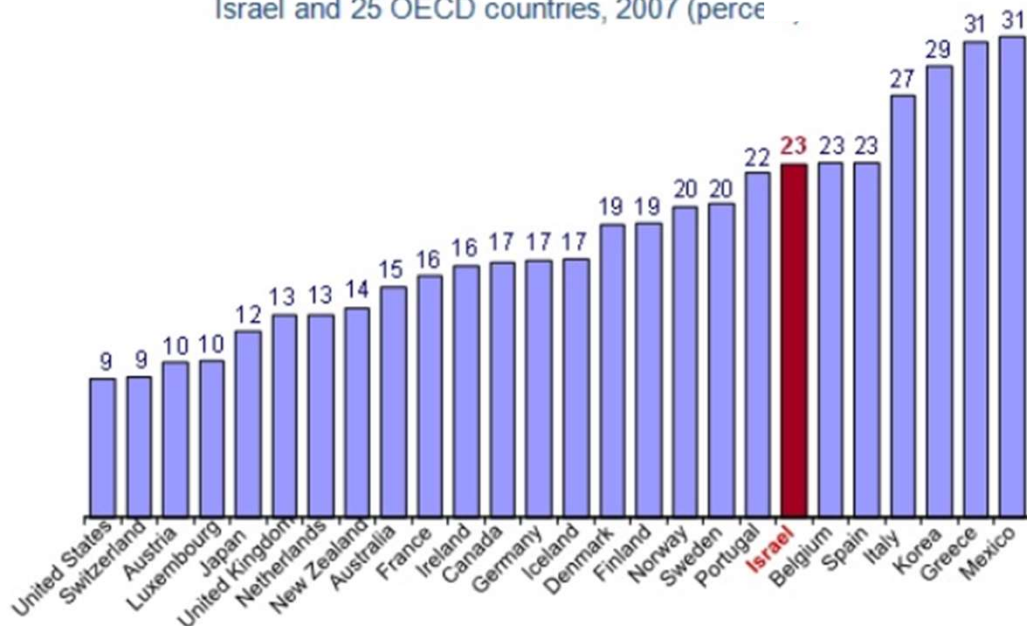
- The bleaching of the Great Barrier Reef
- The role of coal production?

Source: Greenpeace, pinterest.com

GDP takes no account of the 'shadow' economy

### Shadow economy as share of GDI

Israel and 25 OECD countries, 2007 (perce

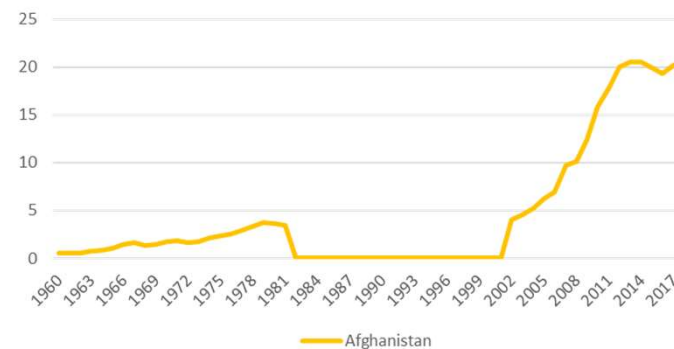


\*Based on multiple indicators including currency demand.

Source: Dan Ben-David, Taub Center and Tel-Aviv University.  
 1: Schneider, Buehn and Montenegro – World Bank 2010.

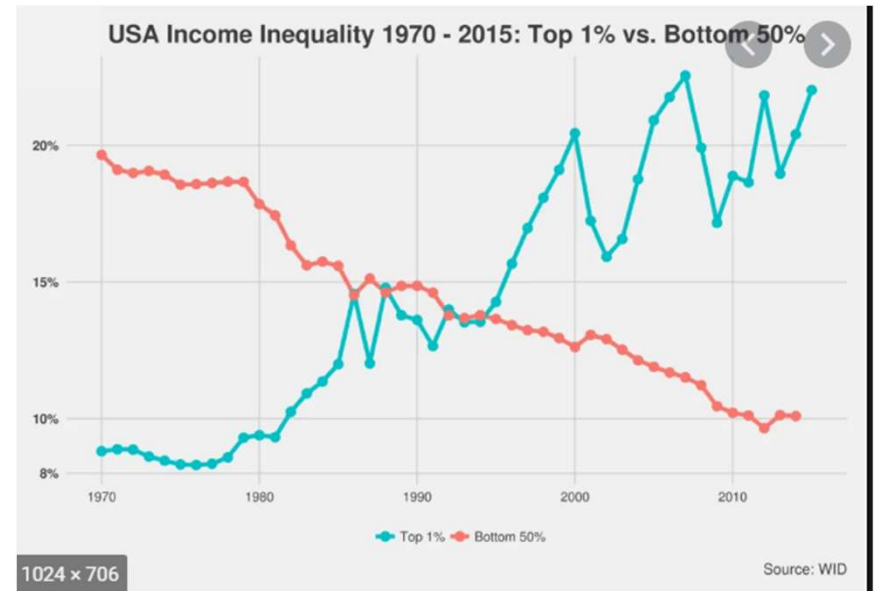
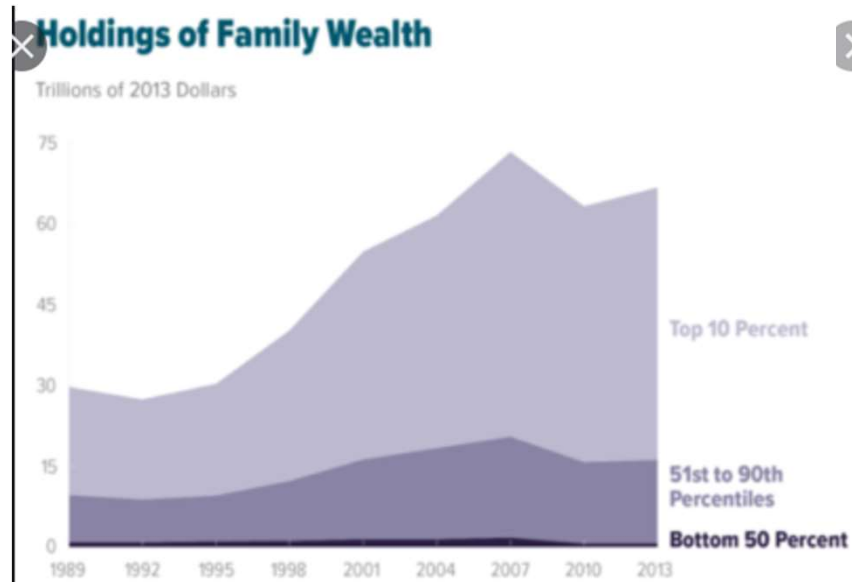
- If we do not take account of the 'shadow economy', we obtain an inaccurate picture of an economy
- Remember Afghanistan?

### GDP in Afghanistan (1960-2018)



Source: World Bank

GDP takes no account of how income and wealth are distributed



- Increasing inequality of income and wealth has become much more pronounced in recent years
- GDP does not take account of this

Source: wikipedia



GDP takes no account of other social outputs like happiness

6,501 views | Jul 11, 2019, 09:57pm

## New Zealand Ditches GDP For Happiness And Wellbeing



**James Ellsmoor** Contributor

Under 30

*A Forbes 30U30 entrepreneur and founder of the Virtual Island Summit.*

### TWEET THIS



This Index would help governments use their budgets with the aim to increase the welfare of its citizens instead of the nation's Gross Domestic Product



New Zealand's change in policy represents a shift that economists have long theorized could be a more effective use of government spending

- Countries are starting to think about whether GDP is an appropriate measure and policy objective
- The economics of happiness:

<https://www.theguardian.com/books/2020/jan/19/richard-layard-everybody-could-have-a-better-time-extract-from-can-we-be-happier>

Source: forbes.com, guardian.com

## Gross Domestic Product (GDP) and Gross National Product (GNP)

- GNP and GDP are related as follows:

$$\text{GNP} = \text{GDP} + \text{Net factor income from the rest of the world}$$

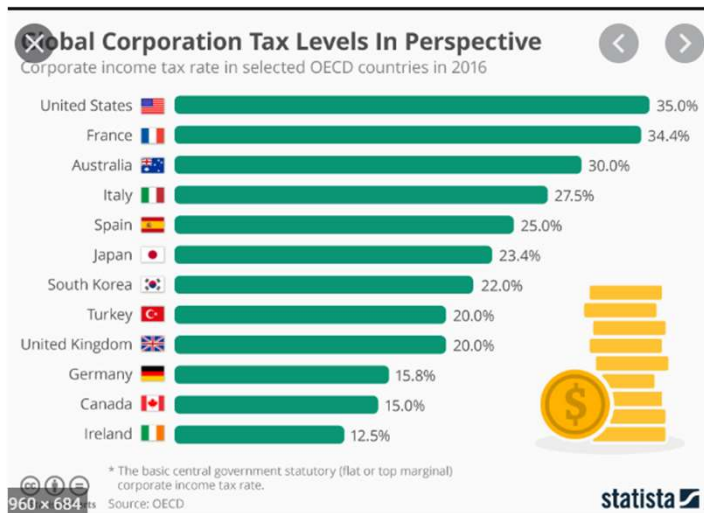
- Net factor income = receipts of factor income from the rest of the world – payments of factor income to the rest of the world
- Factor income includes wages and profits

## Gross Domestic Product (GDP) and Gross National Product (GNP)

- When is GNP significantly different from GDP?
- Case 1: A country that has a significant portion of its population working abroad and sending money home
  - Example?
- Case 2: A country that has a high proportion of companies registered in that country, but which earn profits abroad
  - Examples?

## Gross Domestic Product (GDP) and Gross National Product (GNP)

- Corporation tax in Ireland



## Explainer: Google and its double Irish tax scheme

Why is Ireland's most notorious tax loophole back in the news?

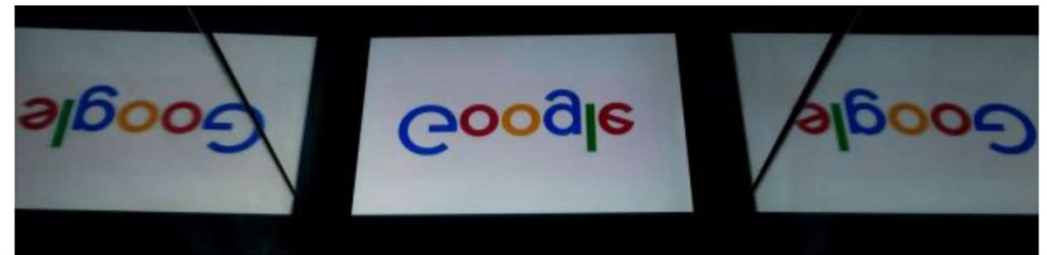
Thu, Jan 2, 2020, 15:30

Updated: Fri, Jan 3, 2020, 16:32



Eoin Burke-Kennedy

Follow



- A hot issue: tax paid by the world's most profitable companies

Source: statsita, Irish Times

## GDP: Conclusion

- GDP is a basic measure of the size of an economy
- It is related to economic progress and well-being, but is not, by itself, a good measure of these
- Nevertheless, it is one of the three basic economic policy objectives pursued by governments:
  - GDP growth
  - Low inflation
  - Low unemployment
- We can think of GDP as the starting point for our analysis of an economy

## How is GDP measured?

- There are 3 ways to measure GDP:
- The value of **Final** Goods and Services produced in the economy during a given period.
  - Definition of Final Goods: A Final Good is a product that the final consumer uses or consumes. Final Goods are ultimately consumed, rather than used in the production of another good.
  - The value of Intermediate Goods were included in the value of Final Goods.
- The sum of **Value Added** in the economy during a given period
  - Value Added: = the value of its production - the value of the intermediate goods used in production
- The sum of **Incomes** in the economy during a given period

PRODUCTION  
SIDE

INCOME  
SIDE

How is GDP measured?: Re-cap

Steel Company (Firm 1)		Car Company (Firm 2)	
Revenues from sales	\$100	Revenues from sales	\$200
Expenses	\$80	Expenses	\$170
Wages	\$80	Wages	\$70
		Steel purchases	\$100
Profit	\$20	Profit	\$30

3 methods to calculate GDP:

1. Value of final goods produced in the period:
2. Sum of value added in the period:
3. Sum of incomes in the period:

How is GDP measured?: Re-cap

Steel Company (Firm 1)		Car Company (Firm 2)	
Revenues from sales	\$100	Revenues from sales	\$200
Expenses	\$80	Expenses	\$170
Wages	\$80	Wages	\$70
		Steel purchases	\$100
Profit	\$20	Profit	\$30

What if the steel is imported by Firm 2?

1. **Value of final goods** produced in the period:
2. Sum of **value added** in the period:
3. Sum of **incomes** in the period:



## Exercise 1

- Suppose that you are measuring annual US GDP by adding up the **final value** of all goods and serviced produced in the economy.
- Determine the effect on GDP of each of the following transactions
  1. A seafood restaurant buys \$100 worth of fish from a fisherman
  2. A family spends \$100 on a fish dinner at a seafood restaurant
  3. Delta Air Lines buys a new jet from Boeing for \$200mn
  4. The Greek national airline buys a new jet from Boeing for \$200mn
  5. Delta Air Lines sells one of its jets to Jennifer Lawrence for \$100mn (ie a second hand sale)

**Solution:**

## Exercise 2

- Suppose that an economy shows only the following activities in a specific year:
  1. It costs an automobile manufacturing company € 10 million to assemble 5,000 cars. The whole \$10mn is wages paid to workers. The cars are then sold to stores for € 12 million.
  2. The stores pay their workers an annual wage of € 1 million and then sell the cars directly to the consumers for € 15 million.
- ***Calculate the GDP in the economy using the production-of - final- goods approach, value-added approach and the income approach separately. Also calculate: Total labor income and total capital income.***

**Solution:**

## Exercise 2

- Suppose that an economy shows only the following activities in a specific year:
  1. It costs an automobile manufacturing company € 10 million to assemble 5,000 cars. The whole \$10mn is wages paid to workers. The cars are then sold to stores for € 12 million.
  2. The stores pay their workers an annual wage of € 1 million and then sell the cars directly to the consumers for € 15 million.
- ***Calculate the GDP in the economy using the production-of - final- goods approach, value-added approach and the income approach separately. Also calculate: Total labor income and total capital income.***

**Solution:**

## Exercise 2

- Suppose that an economy shows only the following activities in a specific year:
  1. It costs an automobile manufacturing company € 10 million to assemble 5,000 cars. The whole \$10mn is wages paid to workers. The cars are then sold to stores for € 12 million.
  2. The stores pay their workers an annual wage of € 1 million and then sell the cars directly to the consumers for € 15 million.
- ***Calculate the GDP in the economy using the production-of - final- goods approach, value-added approach and the income approach separately. Also calculate: Total labor income and total capital income.***

**Solution:**

## Exercise 2

- ***Extensions:***
- ***If the automobile company is based in Thailand and the stores based in Japan, calculate the contribution to GDP in Thailand and Japan of these activities***
- ***Assume now that:***
- ***The automobile manufacturing company is a Japanese company registered in Japan but manufacturing in Thailand***
- ***The car stores are Japanese companies registered and selling cars in Japan***
- ***Calculate the GDP and GNP of Japan***

**Solution:**