

# Macroeconomics in One Equation

## Lecture 1: Introduction and Overview

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For His Glory and Mission

Business & Economics  
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# Outline

- 1** Introduction
- 2** The US Economy
- 3** Quantity Equation
- 4** Scientific Methods
- 5** History and Thought

# Macroeconomics: Basic Questions

## ① What is Macroeconomics?

- Macroeconomics studies overall conditions of the economy.
- The most essential sets of macroeconomic variables are national income, employment, price level, money and interest rate.

## ② Why study Macroeconomics?

- To better understand how the economy functions
- To inform business/financial/policy decisions

## ③ How to study Macroeconomics?

- Learn basic concepts and develop intuition
- Master the tools and acquire quantitative skills
- Follow and analyze the business/market/policy news
- Connect the dots: engage in practice and applications

## ④ Learning Economics intuitively, graphically, and quantitatively.

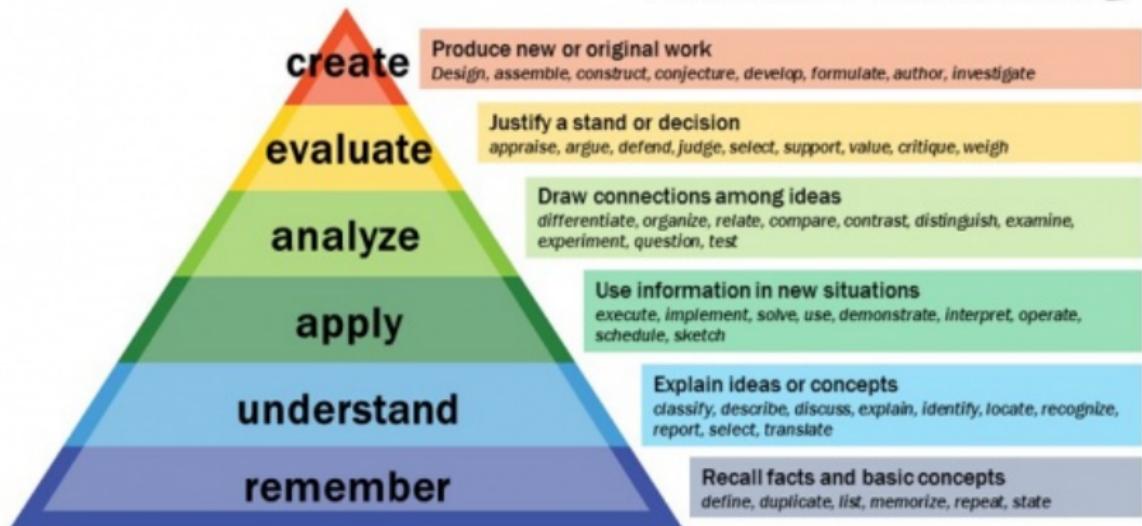
## ⑤ Learning philosophy: core values, vital skills, and critical thinking.

Macroeconomics in the News and Media

- CNBC | Economy <https://www.cnbc.com/economy/>
  - WSJ | Economy [www.wsj.com/news/economy](https://www.wsj.com/news/economy)  
<https://www.wsj.com/video/browse/business/economy>
  - NPR | Planet Money <https://www.npr.org/sections/money/>
  - NY Times | Economy  
<https://www.nytimes.com/section/business/economy>
  - Bloomberg | Economics  
<https://www.bloomberg.com/markets/economics>
  - Reuters | Macromatters  
<https://www.reuters.com/markets/macromatters/>
  - The Economist | Finance & Economics  
<https://www.economist.com/finance-and-economics>
  - Financial Times | US Economy <https://www.ft.com/us-economy>

## Learning Pyramid: Progress to Application and Analysis

# **Bloom's Taxonomy**



Vanderbilt University Center for Teaching

<https://diversifyingecon.org/active-learning>

# Macroeconomics: Nature and Scope

- ① Economics is the study of choice under scarcity. It can be classified into Microeconomics, Macroeconomics, and Finance.
  - ② Microeconomics analyzes how individuals (consumers, producers, and governments) make decisions in the society.
  - ③ Macroeconomics studies how the aggregate economy functions.
  - ④ In nature, Economics is a decision-making social science.
    - Science is human being's inquiry into understanding the universe.
    - Economists, like scientists, follow and apply scientific methodology.
    - The economy and society is the natural laboratory for economists.
  - ⑤ Macroeconomics subfields
    - Money and Banking
    - Monetary Economics
    - International Macro Finance
    - Public Economics & Finance
    - Applied Macro Econometrics

## Macroeconomics in One Equation: MV=PY

$$MV = PY$$

$$Y = F(K, L)$$

$$AD = Y^* = AS$$

$$Y = C + I + G + NX$$

$$\pi = \frac{\Delta P}{P} \approx \frac{\Delta M}{M} - \frac{\Delta Y}{Y}$$

$$M_D = M_D(P, Y, i) = \overline{M_S}$$

$$i \approx r + \pi^e$$

- ① Income and Wealth
  - ② Price Level and Inflation
  - ③ Labor Market Conditions
  - ④ Money and Interest Rates
  - ⑤ Development and Growth
  - ⑥ Business Cycle Fluctuations
  - ⑦ Inflation and Unemployment
  - ⑧ Consumption and Investment
  - ⑨ Government Budget and Fiscal Policy
  - ⑩ Central Banking and Monetary Policy
  - ⑪ Global Economy, Trade, and Finance

# Macroeconomists: Skill Sets

What do macroeconomists do?

- ① Modeling and forecasting  
(business and finance industry)
- ② Policy analysis and evaluation  
(government and public sector)
- ③ Empirical and theoretical research
- ④ Business and legal consulting
- ⑤ Education and training

Essential skills required

- ① Research and optimization
- ② Statistical data analysis
- ③ Mathematical modeling
- ④ Writing and presenting
- ⑤ Communication skills
- ⑥ Systematic thinking

Articles: Top jobs and skills for Economic and Finance Majors

<https://www.thebalancecareers.com/top-jobs-for-economics-majors-2059650>

<https://www.thebalancecareers.com/top-jobs-for-finance-majors-2064048>

# Foundations in Microeconomics

## Opportunity Cost

The opportunity cost of an action is the highest-valued option necessarily forgone. It is forward-looking. Historical cost is not a cost.

## The Law of Demand

When price goes up, quantity demanded goes down, ceteris paribus.

## The Coase Theorem

The delineation of rights is an essential prelude to market transactions.

## Equity and Efficiency

Pareto optimality is the condition under which no one in the society can be made better off unless someone else is getting worse off.

# Resources: Books and Courses

## Online eBooks (downloadable)

- CORE-ECON <https://www.core-econ.org/ebooks/>
- OpenStax: Principles of Microeconomics 2e.  
<https://openstax.org/details/books/principles-microeconomics-2e>

## Online Courses and Videos

- MRU - Principles of Macroeconomics  
<https://mru.org/principles-economics-macroeconomics-0>
- Khan Academy - Macroeconomics  
<https://www.khanacademy.org/economics-finance-domain/macroeconomics>
- Federal Reserve Bank of St. Louis- Economic Lowdown Video  
<https://www.stlouisfed.org/education/economic-lowdown-video-series>
- Learn Liberty Video <https://www.learnliberty.org/videos>

# Resources: Encyclopedia and Articles

- Econ Library - Encyclopedia <https://www.econlib.org/cee/>
- IMF Understanding Economics - Back to Basics  
<https://www.imf.org/external/pubs/ft/fandd/basics/index.htm>
- Brookings Institute - Key Concepts in Macroeconomics  
<https://www.brookings.edu/series/the-hutchins-center-explains/>
- Brookings on the U.S. Economy <https://www.brookings.edu/topic/u-s-economy/>
- Federal Reserve Bank of St. Louis on the Economy  
<https://www.stlouisfed.org/on-the-economy>
- Federal Reserve Bank of St. Louis - Page One Economics  
<https://research.stlouisfed.org/publications/page1-econ>
- Project Syndicate Economics & Finance Columns  
<https://www.project-syndicate.org/section/economics>
- Nobel Prizes in Economic Sciences (1969-present)  
<https://www.nobelprize.org/prizes/lists/all-prizes-in-economic-sciences/>

# Resources for Economists

## Economics & Policy Research

- American Economic Association <https://www.aeaweb.org>
- National Bureau of Economic Research <https://www.nber.org>
- Peterson Institute for International Economics <https://www.piie.com>
- IDEAS – bibliographic database in Economics <https://ideas.repec.org>

## Economists Job Markets

- EconJobMarket <https://econjobmarket.org>
- AEA job market <https://www.aeaweb.org/joe/listings>

## International Governance Organizations

- OECD <https://www.oecd.org>
- World Bank <https://www.worldbank.org>
- World Trade Organization <https://www.wto.org>
- International Monetary Fund <https://www.imf.org>

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# FOMC Press Conference (w)



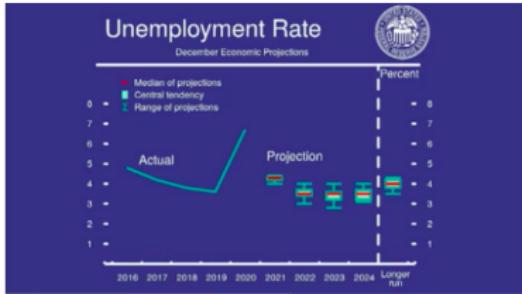
FOMC Press Conference December 15, 2021  
Introductory Statement



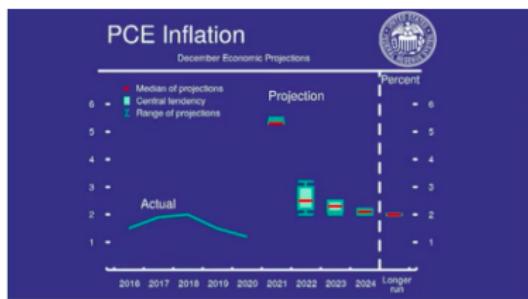
FOMC Press Conference December 15, 2021

<https://www.federalreserve.gov/monetarypolicy/fomcpresconf20211215.htm>

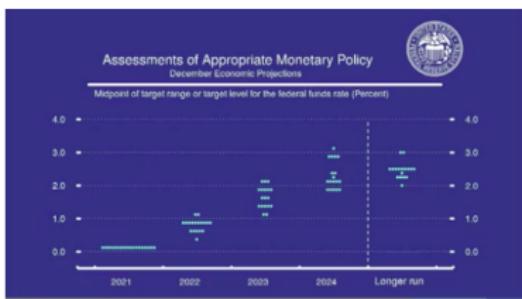
# FOMC Economic Projects (w)



FOMC Press Conference December 15, 2021  
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# FOMC Economic Projections (w)

**Table 1. Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents, under their individual assumptions of projected appropriate monetary policy, December 2021**

Variable	Median <sup>1</sup>					Central Tendency <sup>2</sup>					Range <sup>3</sup>				
	2021	2022	2023	2024	Longer run	2021	2022	2023	2024	Longer run	2021	2022	2023	2024	Longer run
Change in real GDP September projection	5.5 5.9	4.0 3.8	2.2 2.5	2.0 2.0	1.8 1.8	5.5 5.8-6.0	3.6-4.5 3.4-4.5	2.0-2.5 2.2-2.5	1.8-2.0 2.0-2.2	1.8-2.0 1.8-2.0	5.3-5.8 5.5-6.3	3.2-4.6 3.1-4.9	1.8-2.8 1.8-3.0	1.7-2.3 1.8-2.5	1.6-2.2 1.6-2.2
Unemployment rate September projection	4.3 4.8	3.5 3.8	3.5 3.5	3.5 3.5	4.0 4.0	4.2-4.3 4.6-4.8	3.4-3.7 3.6-4.0	3.2-3.6 3.3-3.7	3.2-3.7 3.3-3.6	3.8-4.2 3.8-4.3	4.0-4.4 4.5-5.1	3.0-4.0 3.0-4.0	2.8-4.0 2.8-4.0	3.1-4.0 3.0-4.0	3.5-4.3 3.5-4.5
PCE inflation September projection	5.3 4.2	2.6 2.2	2.3 2.2	2.1 2.1	2.0 2.0	5.3-5.4 4.0-4.3	2.2-3.0 2.0-2.5	2.1-2.5 2.0-2.3	2.0-2.2 2.0-2.2	2.0 2.0	5.3-5.5 3.4-4.4	2.0-3.2 1.7-3.0	2.0-2.5 1.9-2.4	2.0-2.2 2.0-2.3	2.0 2.0
Core PCE inflation <sup>4</sup> September projection	4.4 3.7	2.7 2.3	2.3 2.2	2.1 2.1		4.4 3.6-3.8	2.5-3.0 2.0-2.5	2.1-2.4 2.0-2.3	2.0-2.2 2.0-2.2		4.4-4.5 3.5-4.2	2.4-3.2 1.9-2.8	2.0-2.5 2.0-2.3	2.0-2.3 2.0-2.4	
Memo: Projected appropriate policy path															
Federal funds rate September projection	0.1 0.1	0.9 0.3	1.6 1.0	2.1 1.8	2.5 2.5	0.1 0.1	0.6-0.9 0.1-0.4	1.4-1.9 0.4-1.1	1.9-2.9 0.9-2.1	2.3-2.5 2.3-2.5	0.1 0.1	0.4-1.1 0.1-0.6	1.1-2.1 0.1-1.6	1.9-3.1 0.6-2.6	2.0-3.0 2.0-3.0

NOTE: Projections of change in real gross domestic product (GDP) and projections for both measures of inflation are percent changes from the fourth quarter of the previous year to the fourth quarter of the year indicated. PCE inflation and core PCE inflation are the percentage rates of change in, respectively, the price index for personal consumption expenditures (PCE) and the price index for PCE excluding food and energy. Projections for the unemployment rate are for the average civilian unemployment rate in the fourth quarter of the year indicated. Each participant's projections are based on his or her assessment of appropriate monetary policy. Longer-run projections represent each participant's assessment of the rate to which each variable would be expected to converge under appropriate monetary policy and in the absence of further shocks to the economy. The projections for the federal funds rate are the value of the midpoint of the projected appropriate target range for the federal funds rate or the projected appropriate target level for the federal funds rate at the end of the specified calendar year or over the longer run. The September projections were made in conjunction with the meeting of the Federal Open Market Committee on September 21-22, 2021. One participant did not submit longer-run projections for the change in real GDP, the unemployment rate, or the federal funds rate in conjunction with the September 21-22, 2021, meeting, and one participant did not submit such projections in conjunction with the December 14-15, 2021, meeting.

1. For each period, the median is the middle projection when the projections are arranged from lowest to highest. When the number of projections is even, the median is the average of the two middle projections.

2. The central tendency excludes the three highest and three lowest projections for each variable in each year.

3. The range for a variable in a given year includes all participants' projections, from lowest to highest, for that variable in that year.

4. Longer-run projections for core PCE inflation are not collected.

<https://www.federalreserve.gov/monetarypolicy/fomccalendars.htm>

## FOMC Economic Projections: 2021-24

Figure 1. Medians, central tendencies, and ranges of economic projections, 2021–24 and over the longer run

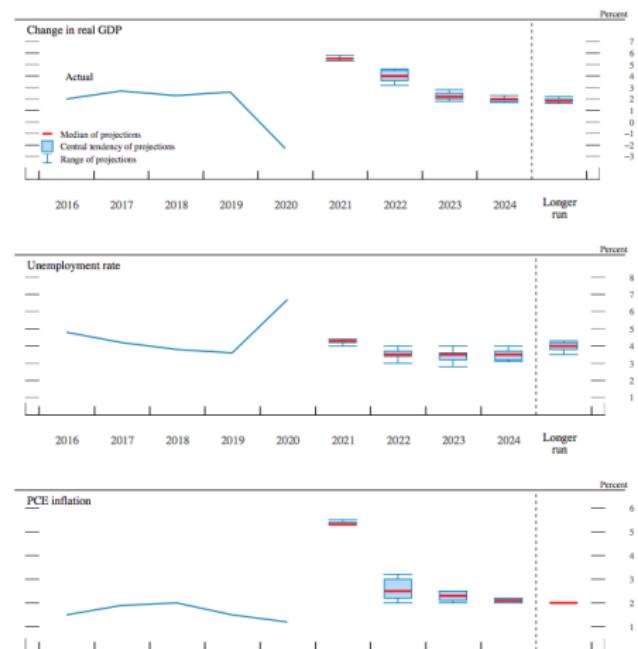
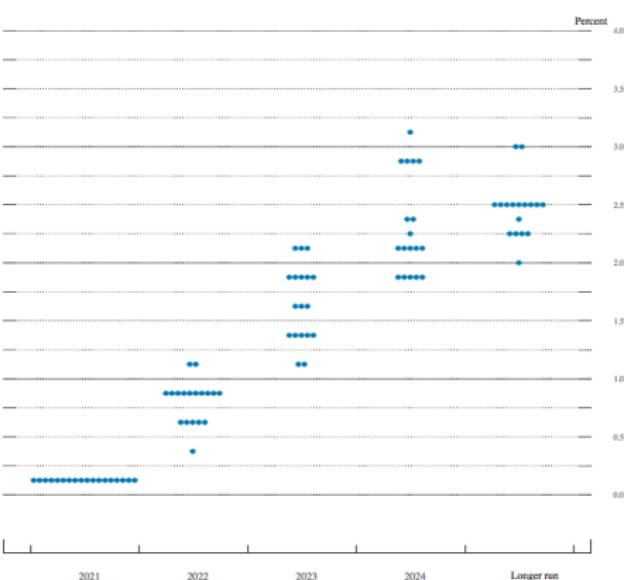


Figure 2. FOMC participants' assessments of appropriate monetary policy: Midpoint of target range or target level for the federal funds rate



<https://www.federalreserve.gov/monetarypolicy/fomccalendars.htm>

# The Conference Board Economic Outlook (w)

	2020				2021				2022				2020*	2021	2022	2023
	I Q*	II Q*	III Q*	IV Q*	I Q*	II Q*	III Q	IV Q	I Q	II Q	III Q	IV Q	ANNUAL	ANNUAL	ANNUAL	ANNUAL
Real GDP	-5.1	-31.2	33.8	4.5	6.3	6.7	2.1	6.5	2.2	3.1	2.9	2.8	-3.4	5.6	3.5	2.9
Real Disposable Income	3.1	48.5	-16.6	-8.3	54.7	-29.1	-4.0	0.0	1.0	1.5	1.7	2.0	6.2	2.6	-1.9	2.2
Real Consumer Spending	-6.9	-33.4	41.4	3.4	11.4	12.0	1.7	5.1	2.5	2.9	2.4	2.1	-3.8	8.0	3.5	2.6
Residential Investment	20.3	-30.8	60.0	34.4	13.3	-11.7	-8.3	1.0	2.0	3.0	2.5	2.0	6.8	9.1	-0.2	1.5
Nonresidential investment	-8.1	-30.3	18.7	12.5	12.9	9.2	1.5	4.6	5.0	5.2	4.8	4.8	-5.3	7.5	4.7	4.4
Inventory Change (bil chn '12\$)	-30	-253	25	89	-88	-169	-73	45	50	55	60	65	-42	-71	58	40
Total Gov't Spending	3.7	3.9	-2.1	-0.5	4.2	-2.0	0.9	2.0	2.5	3.0	3.8	4.1	2.5	0.8	2.3	4.2
Exports	-16.3	-59.9	54.5	22.5	-2.9	7.6	-3.0	2.0	2.0	6.1	5.1	4.0	-13.6	3.6	3.0	4.4
Imports	-13.1	-53.1	89.2	31.3	9.3	7.1	5.8	5.0	6.0	6.0	5.0	4.0	-8.9	13.3	5.6	4.1
Unemployment Rate (%)	3.8	13.1	8.8	6.8	6.2	5.9	5.1	4.3	4.0	3.8	3.7	3.6	8.1	5.4	3.8	3.3
PCE Inflation (%Y/Y)	1.7	0.6	1.2	1.2	1.8	3.9	4.3	5.4	4.6	3.5	3.0	2.8	1.2	3.8	3.5	3.0
Core PCE Inflation (%Y/Y)	1.8	1.0	1.5	1.4	1.7	3.4	3.6	4.4	4.3	3.6	3.2	2.9	1.4	3.3	3.5	3.0

Note: Percentage Change, Seasonally Adjusted Annual Rates.

<https://www.conference-board.org/research/us-forecast>

# Bureau of Economic Analysis: Economy at a Glance (w)

	2018	2019	2020	2019	Q2	Q3	Q4	2020	Q1	Q2	Q3	Q4	2021	Q1	Q2	Q3
<b>Production</b>																
<i>Percent change at seasonally adjusted annual rate (unless otherwise noted)</i>																
Gross domestic product*	2.9	2.3	-3.4	3.2	2.8	1.9	-5.1	-31.2	33.8	4.5	6.3	6.7	2.3			
<b>Purchases, by type</b>																
Gross domestic purchases*	3.1	2.4	-3.0	3.6	2.6	0.5	-4.9	-30.8	37.8	6.1	7.7	6.7	3.5			
Personal consumption expenditures*	2.9	2.2	-3.8	3.6	3.2	1.7	-6.9	-33.4	41.4	3.4	11.4	12.0	2.0			
Nonresidential fixed investment*	6.4	4.3	-5.3	6.7	2.9	-1.7	-8.1	-30.3	18.7	12.5	12.9	9.2	1.7			
Residential investment*	-0.6	-0.9	6.8	4.1	3.6	1.1	20.4	-30.7	59.9	34.4	13.3	-11.7	-7.7			
Exports of goods and services*	2.8	-0.1	-13.6	-2.2	-0.8	1.2	-16.3	-59.9	54.5	22.5	-2.9	7.6	-5.3			
Imports of goods and services*	4.1	1.2	-8.9	1.7	-1.1	-8.5	-13.1	-53.1	89.2	31.3	9.3	7.1	4.7			
Government consumption expenditures and gross investment*	1.4	2.2	2.5	5.0	2.1	3.0	3.7	3.9	-2.1	-0.5	4.2	-2.0	0.9			
<b>Prices of</b>																
Gross domestic purchases	2.3	1.5	1.2	2.2	1.0	1.3	1.6	-1.2	3.3	1.8	3.9	5.8	5.6			
Personal consumption expenditures	2.1	1.5	1.2	2.7	1.1	1.7	1.3	-1.6	3.7	1.5	3.8	6.5	5.3			
Gross domestic product	2.4	1.8	1.3	2.3	1.4	1.5	1.6	-1.5	3.6	2.2	4.3	6.1	6.0			
<b>Personal Income</b>																
<i>Billions of dollars, seasonally adjusted annual rate (unless otherwise noted)</i>																
Real disposable personal income in the U.S.*	3.4	2.3	6.2	-1.4	2.3	2.4	3.1	48.5	-16.6	-8.3	54.7	-29.1	-4.3			
Personal saving rate (level, not change)	7.6	7.6	16.6	7.3	7.2	7.3	9.6	26.1	16.0	13.6	20.5	10.9	9.5			
<b>Federal government finances</b>																
Receipts <sup>d</sup>	3569.0	3713.7	3684.5	3706.0	3708.9	3763.4	3751.2	3481.1	3690.5	3815.1	3982.6	4177.8	4303.6			
Current expenditures <sup>d</sup>	4497.1	4761.1	6794.5	4739.1	4789.8	4823.8	4909.2	9106.7	7206.8	5955.2	8071.4	7490.5	6560.4			
Net Federal Government saving	-928.1	-1047.5	-3110.0	-1033.2	-1080.9	-1060.4	-1150.8	-5625.6	-3516.3	-2140.1	-4088.9	-3312.7	-2256.7			
<b>State and local government finances</b>																
Receipts <sup>d</sup>	2650.6	2793.1	3096.6	2811.4	2810.2	2824.8	2856.3	3550.7	2979.2	3000.2	3100.7	4031.4	3511.7			
Current expenditures <sup>d</sup>	2846.4	2942.1	3020.5	2935.7	2960.7	2977.9	2990.8	2997.2	3045.5	3048.4	3112.5	3202.7	3306.1			
Net state and local government saving	-195.8	-149.0	76.1	-124.4	-150.5	-153.0	-134.6	553.6	-66.3	-48.2	-11.8	828.7	205.6			
<b>Inventories</b>																
Change in private inventories*	...	...	-42.3	49.4	44.0	-1.1	-80.9	-252.8	25.3	88.8	-88.3	-168.5	-66.8			
Ratio, Inventories to final sales*	...	...	...	2.59	2.58	2.56	2.60	2.84	2.63	2.62	2.53	2.42	2.41			
<b>Balance of payments</b>																
Goods and services <sup>d</sup>	-579937.0	-576341.0	-676684.0	-152210.0	-149658.0	-129759.0	-100343.0	-134248.0	-158549.0	-187101.0	-196787.0	-212759.0	-212759.0			
Current account <sup>d</sup>	449699.0	472146.0	616095.0	127691.0	121594.0	-104324.0	143949.0	153866.0	172362.0	175079.0	189424.0	190282.0	190282.0			

<https://www.bea.gov/news/glance>

# Bureau of Labor Statistics: Economy at a Glance (w)

## United States - Monthly Data

Data Series	Back Data	June 2021	July 2021	Aug 2021	Sept 2021	Oct 2021	Nov 2021
<a href="#">Unemployment Rate<sup>(1)</sup></a>		5.9	5.4	5.2	4.8	4.6	4.2
<a href="#">Change in Payroll Employment<sup>(2)</sup></a>		962	1,091	483	379	(P) 546	(P) 210
<a href="#">Average Hourly Earnings<sup>(3)</sup></a>		30.44	30.55	30.67	30.84	(P) 30.95	(P) 31.03
<a href="#">Consumer Price Index<sup>(4)</sup></a>		0.9	0.5	0.3	0.4	0.9	0.8
<a href="#">Producer Price Index<sup>(5)</sup></a>		0.9	0.9	(P) 0.6	(P) 0.6	(P) 0.6	(P) 0.8
<a href="#">U.S. Import Price Index<sup>(6)</sup></a>		1.1	0.3	-0.2	0.4	(P) 1.5	(P) 0.7

### Footnotes

(1) In percent, seasonally adjusted. Annual averages are available for [Not Seasonally Adjusted data](#).

(2) Number of jobs, in thousands, seasonally adjusted.

(3) Average Hourly Earnings for all employees on private nonfarm payrolls.

(4) All items, U.S. city average, all urban consumers, 1982-84=100, 1-month percent change, seasonally adjusted.

(5) Final Demand, 1-month percent change, seasonally adjusted.

(6) All imports, 1-month percent change, not seasonally adjusted.

(P) Preliminary

(R) Revised

## United States - Quarterly Data

Data Series	Back Data	3rd Qtr 2020	4th Qtr 2020	1st Qtr 2021	2nd Qtr 2021	3rd Qtr 2021
<a href="#">Employment Cost Index<sup>(1)</sup></a>		0.5	0.7	0.9	0.7	1.3
<a href="#">Productivity<sup>(2)</sup></a>		4.6	-3.4	4.3	2.4	(S) -5.2
<b>Footnotes</b>						
(1) Compensation, all civilian workers, quarterly data, 3-month percent change, seasonally adjusted.						
(2) Output per hour, nonfarm business, quarterly data, percent change from previous quarter at annual rate, seasonally adjusted.						
(R) Revised						

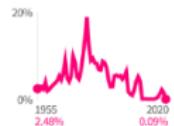
<https://www.bls.gov/eag/eag.us.htm>

# U.S. Census Bureau Economic Indicators (w)

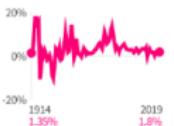


<https://www.census.gov/economic-indicators/>

# USA Facts Economic Indicators (w)



**Federal funds interest rate**  
**0.09%**  
2020



**Average inflation rate**  
**1.8%**  
2019



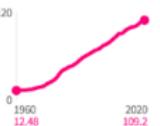
**10-year Treasury constant maturities interest rate**  
**0.89%**  
2020



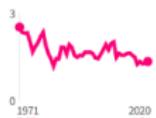
**Crude oil spot price**  
**\$39.16**  
2020



**Gold price per troy ounce**  
**\$1,891.1**  
2020



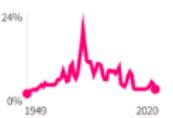
**Consumer price index for all goods, where 2015 prices equal 100**  
**109.2**  
2020



**USD per 1 GBP**  
**1.34**  
2020



**USD per 1 Euro**  
**1.22**  
2020



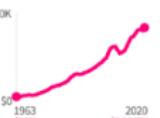
**Prime loan interest rate**  
**3.25%**  
2020



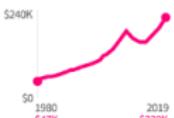
**30-year average interest on fixed-rate mortgages**  
**3.11%**  
2020



**Existing home sales**  
**5.53 million**  
2019



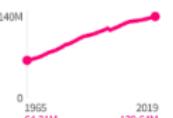
**Median new home sale price**  
**\$334,700**  
2020



**Median home value**  
**\$230,000**  
2019



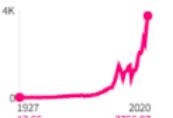
**New home sales**  
**815,000**  
2020



**Housing units**  
**139.64 million**  
2019



**Private fixed investment**  
**\$3.6 trillion**  
2018



**Stock index: S&P 500**  
**3,756.07**  
2020

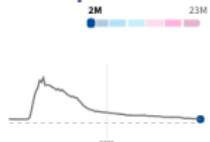


**Stock index: DAX**  
**13,718.78**  
2020

# COVID-19 Impact and Recovery (w)

ECONOMY

**Unemployment Claims**  
Ongoing  
December 18, 2021



In the US, there were **1.7M** unemployment claims on December 18, 2021.

[EXPLORE >](#)

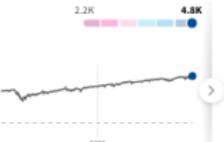
**Inflation Rate (CPI)**  
Core CPI (excl. food and energy) — % Change  
November 1, 2021



Prices in November 2021 were up **5.0%** compared to the same month last year.

[EXPLORE >](#)

**S&P 500**  
December 29, 2021



The S&P 500 closed at **4,793** points on December 29, 2021.

[EXPLORE >](#)

STANDARD OF LIVING

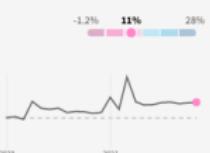
**Household Spending**  
% Change  
November 1, 2021



Household spending was **up 4.6%** from January 2020.

[EXPLORE >](#)

**Personal Income**  
% Change  
November 1, 2021



Personal income was **up 11%** from January 2020.

[EXPLORE >](#)

**Food Scarcity**  
Percent of Adults  
December 13, 2021

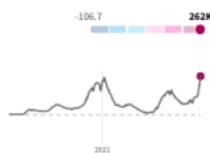


In the US, **9.7%** of adults were facing food scarcity on December 13, 2021.

[EXPLORE >](#)

HEALTH

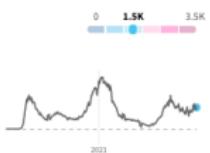
**New COVID-19 Cases**  
7-day Moving Avg.  
December 28, 2021



In the US, there were **262.1K** new COVID-19 cases on December 28, 2021.

[EXPLORE >](#)

**New COVID-19 Deaths**  
7-day Moving Avg.  
December 28, 2021



In the US, there were **1,477** new COVID-19 deaths on December 28, 2021.

[EXPLORE >](#)

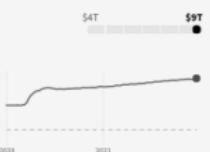
GOVERNMENT

**Federal Govt Spending**  
May 1, 2021



Federal government spending was up **\$23.02B** compared to the same month last year.

**Federal Reserve Assets**  
December 22, 2021



Federal reserve assets were **\$8.79T** on December 22, 2021.

**State Tax Revenue**  
Q3 2021



In the US, state tax revenue was -- in Q3 2021.



<https://usafacts.org/covid-recovery-hub/>

# U.S. Official Economic Indicators

**TOTAL OUTPUT, INCOME, AND SPENDING**

Gross Domestic Product	1
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Available from April 1995 forward, this monthly publication is prepared by the U.S. Council of Economic Advisers for the Joint Economic Committee. It provides economic information on gross domestic product, income, employment, production, business activity, prices, money, credit, security markets, Federal finance, and international statistics. Economic Indicators back to 1948 are made available through the Federal Reserve Archival System for Economic Research. FRASER is provided through a partnership between GPO and the Federal Reserve Bank of St. Louis.

<https://www.govinfo.gov/app/collection/ECONI>

# Federal Reserve Banks: U.S. Economy

## U.S. Economic Conditions Reports

- <https://www.dallasfed.org/research/US>
- <https://www.newyorkfed.org/research/snapshot>
- <https://www.frbsf.org/economic-research/publications/fedviews>
- <https://www.kansascityfed.org/data-and-trends/economic-conditions>

## U.S. Economy Data and Indicators

- <https://www.federalreserve.gov/data.htm>
- <https://nationaleconomicsummary.bostonfed.org>
- <https://www.chicagofed.org/research/data/index>
- <https://www.philadelphiahfed.org/surveys-and-data>
- [https://www.newyorkfed.org/research/data\\_indicators](https://www.newyorkfed.org/research/data_indicators)
- <https://www.dallasfed.org/Home/research/econdata.aspx>
- <https://www.atlantafed.org/research/data-and-tools.aspx>
- <https://www.frbsf.org/economic-research/indicators-data>
- <https://www.clevelandfed.org/our-research/indicators-and-data.aspx>

# FRBSF Macroeconomics Data Post

Topics related to aggregate economic measures, the role of the U.S. government and its policies, financial markets, and monetary policy.

<https://www.frbsf.org/education/teacher-resources/datapost/>

- Gross Domestic Product: Measuring the Nation's Output
- Inflation: Measuring Price Changes
- Unemployment Rate: Measuring the Workforce
- Labor Force Participation Rates: Measuring Workforce Engagement
- Government Spending: Measuring Federal Expenditures
- Personal Saving Rate: Delayed Consumption
- The Money Supply: Measuring M1 & M2
- International Trade Patterns: U.S. Imports

# Outline

- ① Introduction
- ② The US Economy
- ③ Quantity Equation
- ④ Scientific Methods
- ⑤ History and Thought

## Macroeconomics in One Equation: $MV=PY$

The Quantity Theory of Money (QTM) is an economic theory relating the price of the goods and services to the quantity of money in circulation for them. It provides a monetary perspective of economic transactions.

- ① M – money quantity: How many dollars in the economy are available to exchange for the goods and services?
- ② V – transaction velocity: How many transactions occur in each period? Payment technology can affect transaction frequency.
- ③ P – the price of the goods and services in exchange.
- ④ Y – the quantity of the goods and services in exchange.

QTM applies to any single transaction as well as all economic transactions. Throughout our study of Macroeconomics, this equation helps us connect the dots of all chapters.

## QTM: Origin and Evolution

The theory was originally formulated by Polish mathematician Nicolaus Copernicus in 1517, and was influentially restated by philosophers John Locke, David Hume, Jean Bodin. The theory experienced a large surge in popularity with economists Anna Schwartz and Milton Friedman's book *A Monetary History of the United States*, published in 1963 (Source: Wikipedia).

- As developed by the English philosopher John Locke in the 17th century, the Scottish philosopher David Hume in the 18th century, and others, it was a weapon against the mercantilists, who were thought to equate wealth with money.
- If the accumulation of money by a nation merely raised prices, argued the quantity theorists, then a "favourable" balance of trade, as desired by mercantilists, would increase the supply of money but not wealth.
- In the 19th century the quantity theory contributed to the ascendancy of free trade over protectionism. In the 19th and 20th centuries it played a part in the analysis of business cycles and in the theory of foreign exchange rates.

<https://www.britannica.com/topic/quantity-theory-of-money>

## QTM: Intuition and Examples

- The quantity theory of money states that the quantity of money in circulation bears a direct, proportional relationship to the price of the goods and services in transactions.
- Consider a simple example: an economy produce only one good and use one dollar to measure its value. What should be the price of the good?
- All else equal, what should be the price of the good if a hundred dollar were used? And the unit price were two identical goods produced?
- In principle, QTM sets an exchange equation. The equation works well to explain the price of the goods and services. It also helps to understand the exchange rate between two currencies.
- Suppose an apple costs one dollar in the US but a hundred yen in Japan, then the exchange rate should be one dollar for a hundred yen.
- In Macroeconomics, we apply this equation to the analysis of the overall economy, but in a reverse order.

## QTM: The Output Y

- In  $MV=PY$ , the total amount of goods, services, and assets available for exchange in the economy is  $Y$ .
- How do economists measure the aggregate output in an economy?
- National income or aggregate output is the total amount of goods and services produced in an economy. The most common measure of the size of an economy is GDP (gross domestic product).
- The (percentage) change of national income over time can measure economic growth. The fluctuation of aggregate output in a shorter horizon constitutes business cycles.
- From the expenditure (demand) side of the economy, national income can be decomposed into consumption, investment, government spending, and net export. From the production (supply) side of the economy, national income is derived from input factors, including labor market conditions, capital formation and utilization, and production technology.

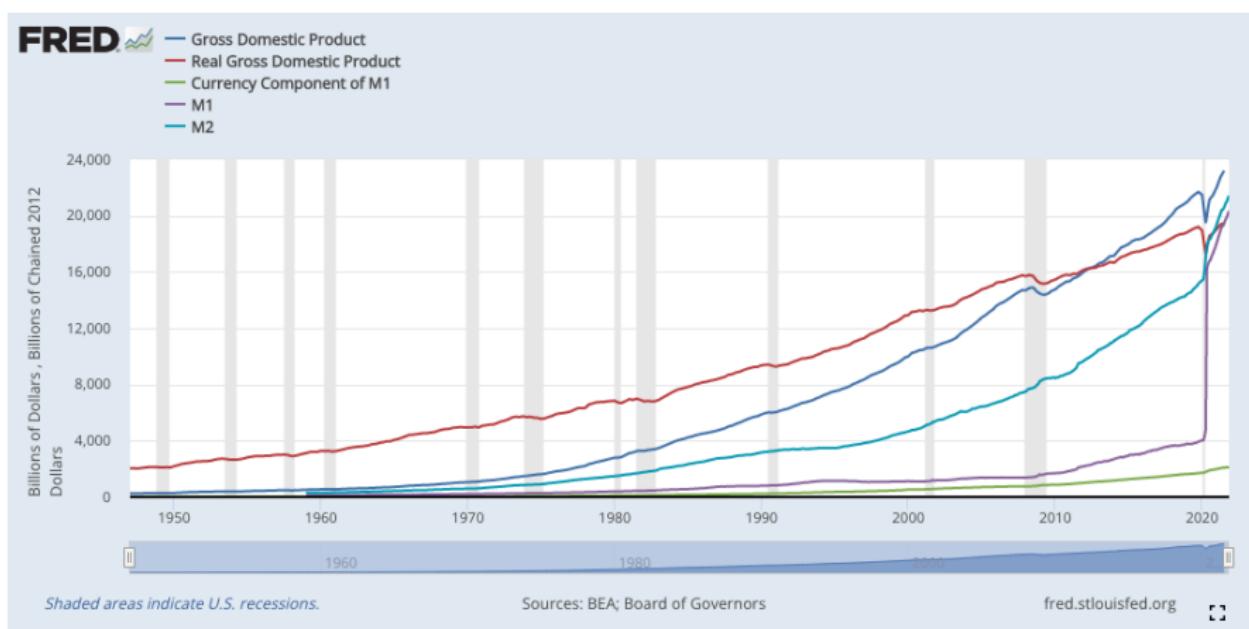
## QTM: The Price Level P

- In  $MV=PY$ , the overall price level is  $P$ . The price level in the economy determines people's living costs and compensations.
- How do economists measure the price level and the living costs?
- The technique is to construct a price index. Economists choose a fixed basket of goods and services representing the economy, measuring its market value over time with the base year indexed as 100.
- Popular measurements: Consumer Price Index (CPI) and core CPI (excluding food and energy), Personal Expenditure (PCE) and core PCE, and Producer Price Index (PPI).
- If an economy experiences increasing price level, goods and services are becoming more expensive, though the real quantity does not increase. The overall rise in the price level is called inflation. The percentage change of the price level is a measure of inflation.
- More essentially, what cause(s) rising price levels? What are the effects? What are the policy implications and measures to keep the price stable?

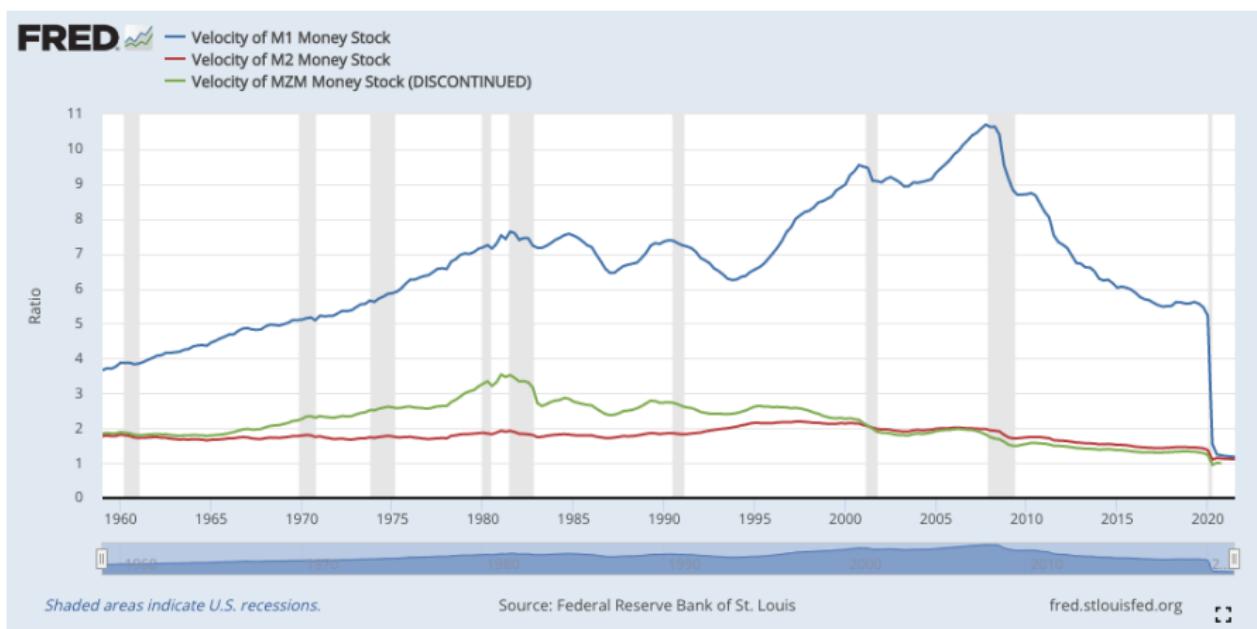
## QTM: Money M and Velocity V

- In  $MV=PY$ , the quantity of money in circulation for market change is M. What is money? Why do we need money? What are the functions of money? Where are the money coming from? And how do economists measure the quantity of money in the economy?
- The velocity of money V is a measure of the number of times that the average unit of currency is used to purchase goods and services within a given time period. The concept relates the size of economic activity to a given money stock, and the speed of money exchange is one of the variables that determine price levels.
- The measure of V is usually the ratio of the national income to its money stock. If V is increasing, then transactions are occurring more frequently. The velocity of money changes over time and is influenced by a variety of factors.  
[https://en.wikipedia.org/wiki/Velocity\\_of\\_money](https://en.wikipedia.org/wiki/Velocity_of_money)
- Finally, what is monetary policy? Who are responsible for conducting monetary policy? What are the effects and outcomes of various monetary policy? How do economists evaluate and inform monetary policy?

# QTM Measurements: Output and Money



# QTM Measurements: Velocity of Money



## MV=PY: Aggregate Causes and Effects

In the quantity equation, holding some variables constant enables us, in turn, to explain the change in other variables.

- V, Y constant, M+  $\Rightarrow$  P+; M-  $\Rightarrow$  P-.
- M, V constant, Y+  $\Rightarrow$  P-; Y-  $\Rightarrow$  P+.
- M, Y constant, V+  $\Rightarrow$  P+; V-  $\Rightarrow$  P-.
- In the short run, macroeconomists assume price rigidity (not flexible); in the long run, price level is fully adjustable. Hence, P is determined.
- In QTM, what are the causes of inflation in the long run?
- Money neutrality assumed, P is determined by changes in M, V and Y, but not vice versa. In reality, P can affect others.
- Deep question: what determine the change in M,V and Y?
- The AD-AS model can explain the effects of M on P and Y, in the short run, the median run, and the long run.

# Macroeconomics: A Set of Four Measurements

Macroeconomics consists of two pairs of measurement variables. Being able to differentiate them is crucial for performing economic and financial analysis.

- ① Flow variable is a value measured in a given period of time.
- ② Stock variable is a value measured at an instant of time.
- ③ Nominal variable is a value measured in monetary units/prices.
- ④ Real variable is a value measured in terms of quantity and quality.

The difference between the flow and stock variables arises from the notion of time. Flow variables are measured in a time interval, whereas stock variables are measured at a specific point in time.

The distinction between the nominal and real variables is a result of the introduction of money. In our monetary world, economic values are measured and standardized in monetary units by convention or by law.

## Flow v.s. Stock Variables

In economics and finance, flow and stock variables keep track of economic values over time in perspective. The accumulation of the flow variable, netting out its "leakages," becomes the stock value. This relationship is applied in almost all economic and financial measurements.

- ① Income and Wealth
- ② Investment and Capital
- ③ Government Deficit and Debt
- ④ International Trade Deficit and Debt
- ⑤ Income statement vs Balance sheet (Accounting)
- ⑥ Balance of payment vs Net Wealth Position (International Finance)

Suppose there is a time line recording flow values at the end of each period, by the end of any given period, the stock value would equal the sum of all previous flow values recorded. In Probability and Statistics, these two concepts correspond to probability  $P(X = x_i)$  and cumulative probability  $P(X \leq x_i)$ .

## Nominal v.s. Real Variables

In economics, nominal value is expressed in monetary terms (in units of a currency). By contrast, real value adjusts nominal value to remove the effects of price level change in the economy. More fundamentally, a real variable is measured in terms of the quantity of goods and services. The five most pivotal real variables in macroeconomics and finance are:

- ① Real income ( $NI/P$ ): goods and services produced in a period.
- ② Real wage ( $W/P$ ): the amount of goods and services that the monetary or nominal wage can afford.
- ③ Real money balance ( $M/P$ ): the purchasing power of money in terms of the amount of goods and services.
- ④ Real exchange rate ( $RE = E * P_F / P_H$ ): the amount of domestic goods and services that a foreign currency can purchase.
- ⑤ Real interest rate ( $r = i - \pi$ ): the rate of return for goods and services, which equals nominal interest rate minus inflation rate.

## QTM: An Equilibrium View

- Like any other identities, the quantity equation of money is always true.
- But it is a powerful tautology. The left hand side of the equation is total monetary value recorded in transactions. The right hand side is the total market value of goods and services in exchange.
- Most economists consider  $M$  as money supply determined by the monetary policy. That's not correct.
- Recall that the demand and supply model characterizes market equilibrium. Neither demand nor supply can determine an equilibrium. It takes both to settle its value.
- Money demand and money supply are determined by (functions of) other variables. An equilibrium view requires economists to study them separately and solve them jointly.
- In sum,  $M$  is the quantity of money in circulation in the economy for market exchange. It is not equivalent to money supply but is an equilibrium quantity where demand and supply intersect, in theory.

## QTM: General Equilibrium View

- In Microeconomics (price theory), the demand and supply model is the only equilibrium model that can be applied to all types of markets: goods market, labor market, real estate market, and financial markets.
- It is important to note that there is a distinction between the money market and the capital market in Finance (Interest Theory).
- Money market applies to short term financial borrowing and lending activities within a year, whereas capital market refers to long term loanable funding transactions greater than one year.
- Money demand and supply determines market interest rates in equilibrium.
- In Macroeconomics (money theory), the output market and money market constitute the closed-economy general equilibrium. The Keynesian IS-LM model is derived from the simultaneous equilibrium in the two markets.
- In International Finance and Macroeconomics, via the foreign exchange market, the general equilibrium in an open economy consists of simultaneous convergence among all three markets.

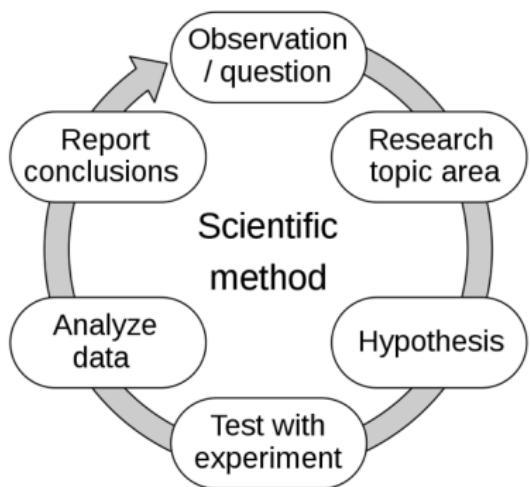
# Outline

- 1** Introduction
- 2** The US Economy
- 3** Quantity Equation
- 4** Scientific Methods
- 5** History and Thought

# The Nature of Economics

- Economics is a decision-making social science.
- Science is human intellectual inquiry into understanding the universe.
- Science discovers underlying patterns, explains causes and effects, enlightens and changes the world.
- Scientists follow principles and standards guided by scientific methods. Hence, people trust science because of its reliability and validity.
- The scientific method requires scientists to derive abstract theory based on certain assumptions to help explain how a complex real world operates.
- More importantly, scientists subject theories and models to empirical tests. Therefore, scientists can develop, reject, refine theories, and apply them in practice.
- Akin to other sciences, Economics consists of explanations (theories and models) that help us understand and make valid predictions about the real world, together with the empirical evidence for and against them.

# Scientific Method and Procedure



[https://en.wikipedia.org/wiki/Scientific\\_method](https://en.wikipedia.org/wiki/Scientific_method)

The scientific method involves careful observation, applying rigorous skepticism about what is observed, given that cognitive assumptions can distort how one interprets the observation.

It involves 1) formulating hypotheses, via induction, based on such observations; 2) experimental and measurement-based testing of deductions drawn from the hypotheses; and 3) refinement (or elimination) of the hypotheses based on the experimental findings.

# Scientific Principles and Procedures

*"Science is the great antidote to the poison of enthusiasm and superstition."*

- ① Science distinguishes a law or theory from facts.
- ② The universe has its own objective laws (not random).
- ③ Data/facts cannot be self-explanatory (not ad hoc).
- ④ It requires abstract theory to explain (not tautology).
- ⑤ A valid theory stands examinations and tests.
- ① Start from the real life observation and data, trying to explain
- ② State the postulate, make assumptions, and develop a theory
- ③ Derive testable or refutable implications from the model
- ④ Collect and process data, design experiment to test the theory
- ⑤ Reject or accept; improve and apply the theory in practice

# Macroeconomic Research: Components

- ① The goal is to make general statements about how the economy works.
- ② Macroeconomic theory: a set of ideas about the economy, based on assumptions and organized in a logical framework
- ③ Macroeconomic model: a simplified description and explanation of some aspect of the economy
- ④ Empirical test: a statistical procedure to examine how consistent and robust is the model to explain the data
- ⑤ Theoretical and empirical research are necessary for economic analysis, forecasting, and policy evaluation.

Usefulness of economic theory or models depends on reasonableness of assumptions, possibility of being applied to real problems, empirically testable implications, and theoretical results consistent with real-world data

# Macroeconomic Research: Procedures

## Data and Research: Developing and Testing an Economic Theory

- ① Examine the data, analyze the patterns, and "tell your story"
- ② State the research question. Why is it interesting and important?
- ③ Make provisional assumptions that describe the economic setting and the behavior of the economic actors.
- ④ Work out the implications of the theory. Following the logic of its assumptions and model solution, what would happen to Y if X changes?
- ⑤ Conduct an empirical analysis to compare the implications of the theory with the data.
- ⑥ Evaluate the results of your comparisons. If the theory fits the data well, use the theory to predict what would happen if the economic setting or policies change.

Source: Adapted from Abel, Bernanke, and Croushore (2020) Macroeconomics, 10e, Pearson.

# Economic Data and Measurements

*Data is a valuable asset and can be the world's most valuable resource.*

- Data (facts/observations/phenomena/statistics) are information collected for reference or analysis (for decision-making purposes).
- As a collection of measurements or observations, data can be divided into two different types: qualitative and quantitative.
- Quantitative, or numerical, data can be broken down into two types: discrete and continuous.
- Qualitative data describes the qualities of data points and is non-numerical. It's used to define the information and can also be further broken down into sub-categories through the four scales of measurement.
- Scales of measurement is how variables are defined and categorized. Psychologist Stanley Stevens developed the four common scales of measurement: nominal, ordinal, interval and ratio.

<https://studyonline.unsw.edu.au/blog/types-of-data>

## Types of Data

### Quantitative

Data that can be measured with numbers, such as duration or speed

#### Discrete

Whole numbers that can't be broken down, such as a number of items

#### Continuous

Numbers that can be broken down, such as height or weight

#### Interval

Numbers with known differences between variables, such as time

### Qualitative

Non-numerical data that is categorical, such as yes/no responses or eye colour

#### Nominal

Data used for naming variables, such as hair colour

#### Ordinal

Data used to describe the order of values, such as 1 = happy, 2 = neutral, 3 = unhappy

## The Four Scales of Measurement



#### Nominal Scale

Used for naming variables in no particular order  
For example, eye colour



#### Ordinal Scale

Used for variables in ranked order, but the difference between is not determined  
For example, #1 happy, #2 neutral, #3 unhappy



#### Interval Scale

Used for numerical variables with known equal intervals of the same distance  
For example, time



#### Ratio Scale

Used for variables on a scale that have measurable intervals  
For example, weight

# The World as 100 People over the last two centuries

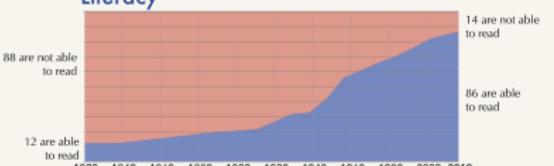
## Poverty



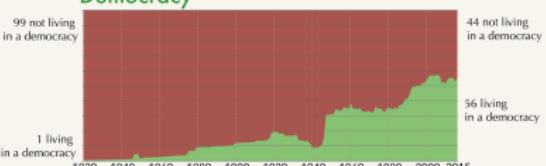
## Basic Education



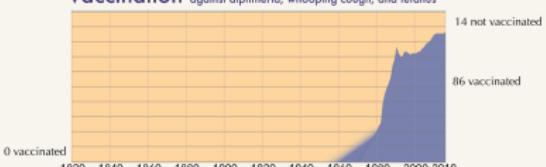
## Literacy



## Democracy



## Vaccination against diphtheria, whooping cough, and tetanus



## Child Mortality

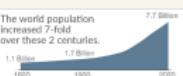

**Data sources:**

Poverty: World Bank from 1961; Bourguignon & Morrison (2002) for extreme poverty up to 1970.  
(All measured in International\$ to adjust for inflation and price differences between countries)

Democracy: Polity IV index (own calculation of global population share)  
Education: UNESCO for the period 1860 to 1960. IASIA for the time thereafter

Vaccination: WHO (Global data are available for 1980 to 2017 – the DPT3 vaccination was licensed in 1949)

Child mortality: up to 1962 own calculations based on Gispertine; World Bank thereafter



A visualization from OurWorldInData.org – the online publication that presents the research and data to make progress against the world's largest problems.

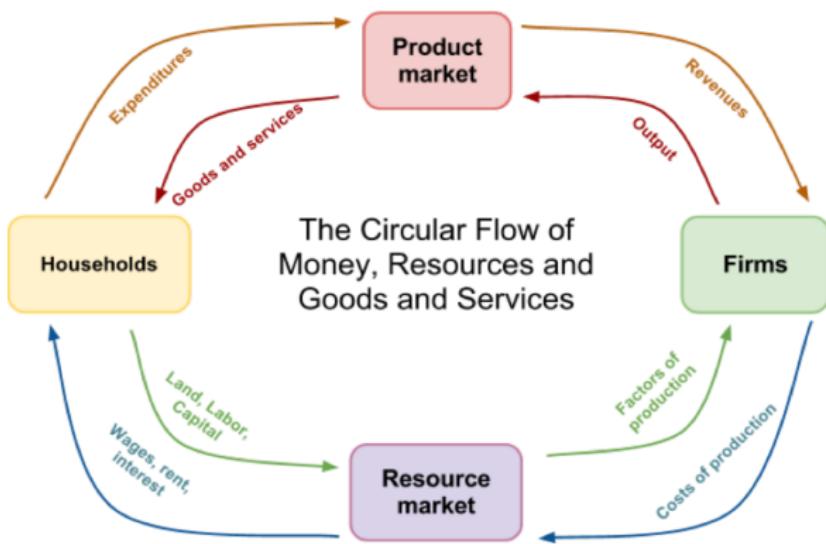
Licensed under CC-BY by the author Max Roser.

<https://ourworldindata.org/a-history-of-global-living-conditions-in-5-charts>

# Economic Theory: Assumptions and Models

- Economic theory is a systematic collection of the ideas and principle that aim to describe how economies work.
- Economic theory starts with its postulate: a statement assumed to be true without proof. It serves to explain undefined terms, and to serve as a starting point for proving other statements. Postulates are not facts.
- Postulate of Economics: Rationality or Self-Interest or Economic Man.
- Assumption is a statement that is assumed to be true and from which a conclusion can be drawn. Economists often make simplified and unrealistic assumptions for constructing a model.
- Economists use models to simplify reality in order to improve our understanding of the world and help us make predictions and decisions. Models can be displayed in various forms, mostly in mathematical equations or geometric graphs.

## Example: The Economy in Diagram



To help us visualize the complex economic system, economists simplify it in a circular-flow diagram, which includes two economic agents and two different markets. Firms and households exchange their goods and services in the product market and the factor market. To facilitate all these transactions, money is the medium of exchange and unit of account.

## Example: Production Possibilities Frontier (w)

- The points show how much of each good will be produced when resources shift, thus impacting more production of one good and less of the other.
- It doesn't indicate how much of each good should be produced, but the production sacrifice needed to make more of the other good.

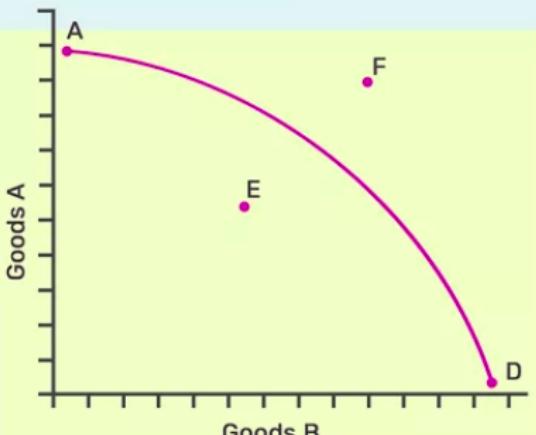
- It demonstrates the concept of opportunity cost.

E: All resources are not being used.

F: Any point outside the PPF curve is impossible; more of both goods cannot be produced with current resources.

A: More of goods A are being produced and none of goods B are being produced.

D: None of goods A are being produced and more of goods B are being produced.

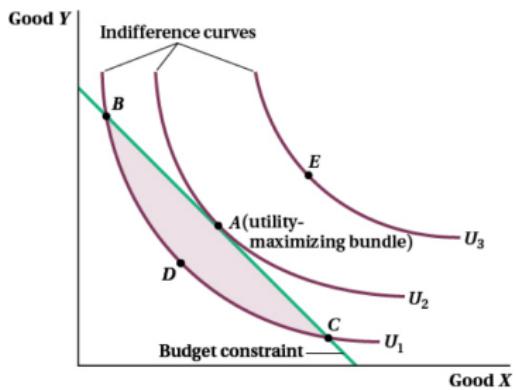


 the balance

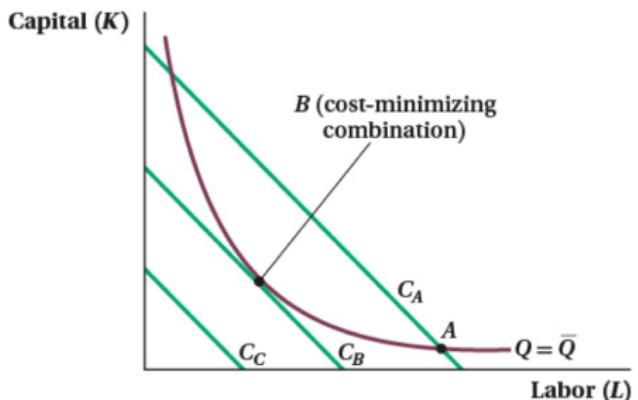
A production possibilities frontier (PPF) depicts the maximum output of two goods using a given amount of input. The input is any combination of production factors such as natural resources, human and social capitals. The PPF is derived from the opportunity cost in production. It can illustrate the concepts of economic efficiency and growth.

# Agent Optimization Models

## Consumer: Utility Maximization

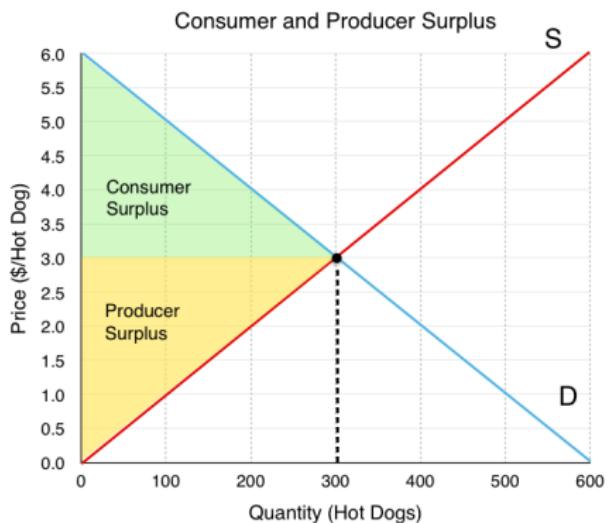


## Producer: Cost Minimization



Source: Goolsbee, Levitt & Syverson (2020) Microeconomics, 3e, Worth

# Market Equilibrium Model



- Market equilibrium:  
 $D : Q_D = a - bP$   
 $S : Q_S = c + dPE : Q_D^* = Q^*(P^*) = Q_S^*$
- Market welfare measures net gain from exchange (consumer surplus and producer surplus).
- Consumer surplus (CS): reservation value minus price.
- Producer surplus (PS): price minus reservation cost.

<https://pressbooks.bccampus.ca/uvic/econ103/chapter/3-6-equilibrium-and-market-surplus/>

# Economic Analysis: Positive v.s. Normative

## Positive Economics

*Seeks to understand behavior without making judgments about outcomes*



**Does a currency devaluation fuel inflation?**

**Are oil prices contributing to a GDP slowdown?**

**Disposable income has declined by 15% over the past four years.**

**When disposable incomes fall the demand for own-label supermarket foods rises**

**Raising tax on beer will have a negative effect on the profits of brewers.**

**Higher interest rates will dampen house prices.**

## Normative Economics

*Analyzes outcomes of economic behavior, evaluates them as good or bad, and sometimes prescribes a course of action*



**Higher education should be free.**

**Should alternative fuels be subsidized?**

**We must try to boost disposable income.**

**Basic healthcare to all citizens should be free.**

**Unemployment is more harmful than inflation.**

**The minimum wage should be raised by 20%.**

**Market mechanisms should be allowed to work freely in order to make sure resources are best allocated.**

**Alcohol consumption should be controlled by enforcing minimum prices for alcoholic beverages sold in supermarkets.**

Positive statements: descriptive and explanatory (what, when, where, how, and why)

Normative statements: subjective and prescriptive (involve moral and value judgement)

# Outline

- ① Introduction
- ② The US Economy
- ③ Quantity Equation
- ④ Scientific Methods
- ⑤ History and Thought

# (R)Evolution of Economic Thought

## ① Classical Political Economy

- Adam Smith (1776) An Inquiry into the Nature and Causes of the Wealth of Nations
- David Ricardo (1817) Principles of Political Economy and Taxation
- John Stuart Mill (1848) Principles of Political Economy with some of their Applications to Social Philosophy

## ② Neoclassical Economics

- Alfred Marshall (1890) Principles of Economics

## ③ Keynesian Revolution

- John Maynard Keynes (1936) The General Theory of Employment, Interest, and Money

## ④ Modern Economic Analysis

- Paul Samuelson (1947) Foundations of Economic Analysis

# (R)Evolution in Macroeconomics

- ① Keynesian Macroeconomics and Neoclassical Synthesis (John Hicks, Alvin Hansen, Paul Samuelson, Franco Modigliani, James Tobin, Robert Solow, Lawrence Klein)
- ② Monetarism (Milton Friedman, Anna Schwartz, Karl Brunner, Allen Meltzer, Edmund Phelps; David Laidler, Michael Parkin, Alan Walters)
- ③ New Classical Macroeconomics
  - Rational Expectation Critique (Robert Lucas, Robert Barro, Thomas Sargent, and Neil Wallace)
  - Real Business Cycle theorists (Finn Kydland and Edward Prescott)
- ④ New Keynesian Economics (George Akerlof, Janet Yellen, N. Gregory Mankiw, Peter Diamond, Dale Mortensen, Ben Bernanke, Mark Gertler)
- ⑤ New Growth Theory (Paul Romer, Philippe Aghion, Peter Howitt, Andrei Shleifer, Daron Acemoglu)
- ⑥ Toward an integration: Dynamic Stochastic General Equilibrium (DSGE) (Michael Woodford and Jordi Galí)

## Mercantilism

Arguments **in favour of state involvement** in society

- Based on **'Bullionism'** Economic health of a nation measured stores of gold/silver in reserve
- Link between **wealth and trade** – As Exports = Imports = Building up gold/silver reserves (prosperity)
- Trade only where it benefits your exports. Ignore principle of **comparative advantage**
- Gov should **reduce imports** via tariffs, subsidies and granting exclusive rights (National advantage and imperative to run a trade surplus i.e. money gold/silver must flow in)
- Import substitution/Economic self sufficiency** vital (via domestic manufacturing)
- Strong political authority** vital (at the expense of individual liberty) to coordinate economy and solve conflict
- State would **aggressively seek to expand its position** as with great wealth comes great political power
- Key Industry:** Manufacturing (but agriculture needs to be encouraged)
- Colonies should be **exploited** as a source of raw materials and a market for manufactured goods

## Physiocrats

'Government of nature'  
Rely on 'rule of nature' **not state involvement**. Maximum freedom of the individual

### Francois Quesnay

- Allow economy to follow 'natural order'
- Role of state is to **uphold 'natural order'** and **preserve private property**
- Key Industry:** Agriculture (all wealth derives from the soil)
- 3 Economic Sectors**
  - Proprietary Class (Landowners)
  - Productive Class (Agrilabourers)
  - Sterile Class (Artisans and Merchants)
- Free trade with no protectionism** – 'Laissez faire' (leave it alone)

16<sup>th</sup> and 17<sup>th</sup> Century

18<sup>th</sup> Century

<https://piigsty.com/category/economics-101/>

## Classical School (Capitalism)

Rely on 'rule of nature' **not state involvement**. Maximum freedom of the individual.  
Labour is the source of value (**Labour Theory of Value**) + Profit Motive

### Adam Smith

- Major Work:** 'The Wealth of Nations' (1776)
- Advanced 'laissez faire' system of natural liberty + specialisation of ones labour (new Political/Social order)
- Everyone should be free to pursue own 'self interest' + Free International trade
- Trade = Zero Sum** (Everyone gains!)
- Selfish interests benefit society as, unobstructed by government, the 'Invisible hand' of markets will guide markets to their most efficient uses and determine prices
- Key Industry:** Manufacturing (Rejected Physiocrats view)
- State role:** national defence, legal system, public works (via taxation)

### David Ricardo

- Major Work:** 'Principles of Political Economy and Taxation' (1817)
- Pessimistic 'Theory on Rent': Small population (POP) = supply food domestically via best land + low rent = High output/Profits
- Demand for land↑, Wages↑, POP↑, Demand for food↑, Use of less quality land↑, Rents↑, Landowning Profits↑
- Bad thing for industrial productivity
- Also, **Theory of Comparative Advantage** in Trade

### Thomas Malthus

- Major Work:** Pessimistic work 'Essay on the Principle of Population.' (1798)
- Population growth** = Geometric growth but food supply growth = Arithmetic growth (poverty and starvation is inevitable)
- This leads to a low standard of living for all (fuelled by 'Iron Law of Wages' i.e. ↑Wages ↑Population ↓SOI ↓Wages )
- Only checks on pop growth 'misery', 'vice' and 'moral restraint'

### John Baptiste Say

- Major Work:** 'Treatise on Political Economy' (1803)
- Law of Markets (Say's Law)** = Supply creates its own demand
- People work to buy goods/services (demand) and exchange their own surplus goods for the surplus goods of others. So, no overproduction!
- Income can be saved, Interest rates would fall, demand would rise

### JS Mill

- Major Work:** 'Principles of Political Society' (1848)
- State role:** Gov can tax excess earnings (landowners) and wealth spread
- Overproduction is impossible (Say's Law)
- Increasing returns to scale for large scale firms
- Trade unions have a role in countering employer power
- Accepted subsistence theory of wages (Iron Law)

18<sup>th</sup> and 19<sup>th</sup> Century

19<sup>th</sup> Century**Socialism**

Much social and political change (after Industrial Revolution and Railway Mania of mid 1800s)

**Karl Marx**

- Major Work: Communist Manifesto (1848)
- Labour Theory of Value (like Classical writers) : Value of good = Labour needed to produce it
- No invisible hand
- Capitalists exploit wealth (created by labour)
- Capitalists want ↑Profit so they demand more labour, ↑Wages (above subsistence)
- Capitalists don't want to pay ↑Wages (hits profitability)
- Replace workers with technology, new methods of production (less labour intensive) = Unemployment
- In the drive for ↑Profit, Wages eventually ↓
- But only Labour can generate profits. Unemployment = Reduced demand (Vicious cycle)
- Workers become 'deskilled' as mere 'cogs in a machine' for profit (Alienated)
- Provokes profitable firms to merge – centralised power in fewer and fewer capitalists
- Poverty, oppression, exploitation and enslavement ensues

Early/Mid 20<sup>th</sup> Century**Rebirth of Classical School**

(Neo-Classical)

The 'Paradox of Value': How do we judge the value of a good?

- Smith, Marx and Ricardo all believed in the Labour Theory of Value (it's the cost of labour that determines price of a good). If its easy to acquire or plentiful and easy to produce, it will be cheap.
- Birth of a new idea: Value is instead based on 'Utility' or consumer satisfaction
- Marginal Utility (of consuming additional units) determines price. High MU = High Price

**(Neo Classical) Keynesianism****Lessons of 1930s Great Depression**

Recessions a major problem. Says Law wrong? Unemployment can persist because wages can remain high. Interest rates can be ineffective to spur economic growth

**John Maynard Keynes**

- Major Work: The General Theory of Employment, Interest and Money (1936)
- Idea: **Damage Management**
- Unemployment is caused by **Insufficient demand** for goods/services in the economy and the economy can settle with high unemployment for a long period. Afterall 'in the Long Run, we're all dead' so action needs to be short run
- Wages aren't always flexible downwards (can't be cut – provokes industrial/social unrest) aka 'Sticky Wages'
- Level of investment in economy (in recession) **insufficient**. Supply > Demand and unemployment follows
- **Fiscal Policy** of a state can prevent unemployment and economic recession
- State plays a role (regulates the economy when needed) raise aggregate demand itself by stimulus spending (by borrowing and investing i.e. by running budget deficits IF it means coming the economy healthy)
- State spending smooths out the bumps caused by market cycle (**Boom-Bust**)
- This creates **employment** (and prevents unemployment)

Late 20<sup>th</sup> Century**Monetarism**

Monetary Policy **not** Fiscal Policy should be key to economic management (Keynesianism doesn't help with inflation)

**Milton Friedman**

- ↑Money Supply = ↑Inflation (↓Competitiveness of exports)...so...Increasing public spending will only increase prices (not output)
- Control Money Supply (via interest rates, limiting loans and public spending) = **Control inflation**
- Idea: **Supply side policies** (anything that attempts to influence labour supply or supply of goods and services)
  1. Cut income tax
  2. Encourage market competition
  3. Reduce role of trade unions in the labour market
- **Minimise state role in economy** return to laissez faire (back to Smith's 'invisible hand') via privatisation of state assets and encouraging business growth
- **Price stability MOST important goal** (not full employment as in Keynesianism)

# The Great Depression 1929-1941 (w)

*The longest and deepest downturn in the history of the United States and the modern industrial economy lasted more than a decade, beginning in 1929 and ending during World War II in 1941.*

- The Great Depression began in August 1929, when the economic expansion of the Roaring Twenties came to an end.
- A series of financial crises punctuated the contraction. These crises included a stock market crash in 1929, a series of regional banking panics in 1930 and 1931, and a series of national and international financial crises from 1931 through 1933.
- The downturn hit bottom in March 1933, when the banking system collapsed and President Roosevelt declared a national banking holiday.
- Sweeping reforms of the financial system accompanied the economic recovery, which was interrupted by a double-dip recession in 1937. Return to full output and employment occurred during the Second World War.

# The Great Depression: Google Search Images

A Google search results page for the query "great depression". The results are displayed as a grid of 20 image thumbnails, each accompanied by a snippet of text from a source website. The thumbnails show various scenes of the Great Depression, such as people standing in breadlines, men at a soup kitchen, and a man holding a sign asking for work.

- Great Depression | Definition, History... britannica.com
- Great Depression - Wiki... en.wikipedia.org
- Great Depression ... theguardian.com
- Great Depression: Causes and Definition ... history.com
- The Great Depression | Federal Reserve ... federalreservehistory.org
- Causes of the Great Depression | Brit... britannica.com
- Great Depression insider.com
- During the Great Depression People ... history.com
- The Lessons of the Great Depression ... theatlantic.com
- Great Depression Altered U... thoughtco.com
- Great Depression : Throughline : NPR npr.org
- What Caused the Great Depression ... businessinsider.com
- COVID-19 Crunch Compares To Spanish... forbes.com
- Great Depression : Throughline : NPR npr.org
- economic crises ... marketplace.org
- America Is Looking at a Likely ... marker.medium.com
- Your Guide To The Great Depression ... historyextra.com
- The Great Depression | Scho... schoolshistory.org.uk

# The Great Depression and The General Theory

- Without the Great Depression, The General Theory of Employment, Interest and Money (1936) would not have seen the light of day.
- Keynes's aim in writing this book was to elucidate the causes of the mass unemployment that affected all major economies at that time, and to suggest policy measures that could be taken to solve the problem.
- This was a time of great disarray with no remedy at hand to fix the ailing economic system. In most countries, the unemployment rate was soaring and deflationary policies had failed. There was little room in economic theory for unemployment.
- The notion of frictional unemployment had started to be evoked but it had little theoretical content. So, faced with the looming presence of the Great Depression, Keynes realised that monetary theory was blatantly wanting, and needed to be reformed.

M. De Vroey and P. Malgrange (2011) The History of Macroeconomics from Keynes's General Theory to the Present. Discussion Paper 2011-28.

## Keynes and the Great Depression

The history of modern macroeconomics starts with the publication of John Maynard Keynes's General Theory of Employment, Interest, and Money in 1936. The General Theory is in fact business cycle theory that emphasizes effective demand (aggregate demand): Effective demand determines output.

- Few economists during the 1930s could provide a coherent explanation for the depth and breadth of the Great Depression.
- Keynes' General Theory delivered an intellectual framework to explain events and guide policy. Keynes emphasized what we now call aggregate demand. In particular, Keynes stressed the slow adjustment back to the natural level of output after an adverse demand shock.
- The General Theory introduced a number of ideas—the multiplier, money demand, liquidity trap, and the importance of expectation—that are fundamental to modern macroeconomics.

Olivier Blanchard (2021), Ch24, Macroeconomics, 8e, Pearson.

# Keynes and The General Theory

The General Theory was more than a treatise for economists. It offered clear policy recommendations, and they were in tune with the times: Waiting for the economy to recover by itself was irresponsible. In the midst of a depression, trying to balance the budget was not only stupid, it was dangerous. Active use of fiscal policy was essential to return the country to high employment. Keynes built the building blocks of modern macroeconomics:

- The relation of consumption, to income and the multiplier effects
- Liquidity preference in the demand for money that explains how monetary policy affect interest rates and aggregate demand
- The importance of expectations in affecting consumption and investment; and shifts in expectations (animal spirits) behind shifts in demand and output (boom and bust)

Olivier Blanchard (2021), Ch24, Macroeconomics, 8e, Pearson.

## Keynesian Macroeconomics (w)

Keynesian economics dominated economic theory and policy after WWII until the 1970s. It is a theory of total spending in the economy (aggregate demand) and its effects on output and inflation. Key tenets include

- ① Aggregate demand is influenced by a host of economic decisions, both public and private, and sometimes behaves erratically.
- ② Changes in aggregate demand, whether anticipated or unanticipated, have their greatest short-run effect on real output and employment, not on prices.
- ③ Prices, and especially wages, respond slowly to changes in supply and demand, resulting in periodic shortages and surpluses, especially of labor.
- ④ Many Keynesians advocate activist stabilization policy to reduce the amplitude of the business cycle.

<https://www.econlib.org/library/Enc/KeynesianEconomics.html>

# Classical vs Keynesian Macroeconomics

- The classical approach to macroeconomics is based on the assumptions that individuals and firms act in their own best interests and that wages and prices adjust quickly to achieve equilibrium in all markets.
- Under these assumptions the invisible hand of the free-market works well, with only a limited scope for government intervention in the economy.
- The Keynesian approach to macroeconomics assumes that wages and prices do not adjust rapidly and thus the invisible hand may not work well.
- Keynesians argue that, because of slow wage and price adjustment, unemployment may remain high for a long time.
- Keynesians are usually more inclined than classicals to believe that government intervention in the economy may help improve economic performance.

Abel, Bernanke, and Croushore (2020), CH1, Macroeconomics, 10e, Pearson.

## Keynesian Economics: Neoclassical Synthesis

- According to Keynes, the classics saw the price system in a free economy as efficiently guiding the mutual adjustment of supply and demand in all markets, including the labor market. Unemployment could arise only because of a market imperfection—the government intervention or the action of labor unions—and could be eliminated.
- In the 1950s, Keynesian economists achieved a measure of reconciliation with the classics. Paul Samuelson argued for a "neoclassical synthesis" in which classical economics was viewed as governing resource allocation when the economy was kept at full employment through macro policies.
- Other Keynesian economists sought to explain consumption, investment, the demand for money, and other key elements of the aggregate Keynesian model in a manner consistent with the assumption that individuals behave optimally. This was the program of "microfoundations for macroeconomics." The Neoclassical Synthesis, however, omitted the role of expectations and wage-price adjustment.

<https://www.econlib.org/library/Enc/NewClassicalMacroeconomics.html>

## Neoclassical Synthesis

By the early 1950s, a consensus had emerged around an interpretation and extension of Keynes' ideas.

- John Hicks (1930s) and Alvin Hansen (1940s) constructed IS-LM model. Hicks won the Nobel prize in 1972.
- Franco Modigliani (1950) and Milton Friedman (1957) developed the theory of consumption. Friedman was awarded Nobel prize in 1976 and Modigliani 1985.
- James Tobin developed the theory of investment, the theory of money demand and the portfolio selection theory. Nobel laureate of 1981.
- Robert Solow (1956) developed the theory of economic growth. Nobel laureate of 1987.
- Lawrence Klein (1950s) pioneered the first econometric models for the analysis of economic fluctuations and policies. Nobel laureate of 1980.

<https://www.nobelprize.org/prizes/lists/all-prizes-in-economic-sciences/>

## Monetarism and Monetarists (w)

- Monetarism is a macroeconomic school of thought that emphasizes (1) long-run monetary neutrality, (2) short-run monetary nonneutrality, (3) the distinction between real and nominal interest rates, and (4) the role of monetary aggregates in policy analysis.
- Two fundamental monetarist propositions are (1) that cyclical movements in nominal income are primarily attributable to movements in the stock of money, and, (2) that there is no permanent trade-off between unemployment and inflation.
- All monetarists emphasized the undesirability of combating inflation by nonmonetary means, such as wage and price controls or guidelines, because these would create market distortions. They stressed, in other words, that ongoing inflation is fundamentally monetary in nature, a viewpoint foreign to most Keynesians of the time.

<https://www.econlib.org/library/Enc/Monetarism.html>

## Monetarists vs Keynesians

The debate between Keynesians and monetarists centered on three issues.

- Monetary versus fiscal policy: monetarists questioned the emphasis of the early Keynesians on the power of fiscal policy to stabilize output. Instead, monetarists emphasized the power of monetary policy to destabilize the economy in the absence of a money growth rule to constrain the Fed.
- The Phillips curve: many Keynesians believed that the Phillips curve offered a permanent long-run tradeoff between inflation and unemployment. Milton Friedman and Edmund Phelps argued that the tradeoff would disappear if policymakers tried to exploit it.
- The role of policy: Keynesians believed that fiscal and monetary policy could be used to fine tune macroeconomic performance to avoid fluctuations. Monetarists argued instead that economists did not know enough to stabilize output and that in any event, policymakers could not be trusted to do the right thing. Therefore, policymakers should be bound by simple rules.

Olivier Blanchard (2021), Ch24, Macroeconomics, 8e, Pearson.

## Rational Expectations Revolution

- The mainstream consensus of the 1960s received two challenges in the 1970s. The first challenge was empirical. Aggregate demand shocks could not account for stagflation (simultaneous increases in inflation and unemployment) which arose during the 1970s.
- The second challenge was intellectual. The new rational expectations view argued that people form expectations about the future using all available information, including economic theory and econometric models, rather than solely on the basis of the past behavior of the variables they are trying to forecast. This idea posed three challenges for Keynesian macroeconomics: Lucas critique, Philips curve puzzle, and policy control.
- Rational expectations implied that Keynesian models could not be used to evaluate potential policy measures, that Keynesian models could not explain persistent deviations of output from its natural level, and that the theory of policy needed to be redesigned via the tools of game theory.

Olivier Blanchard (2021), Ch24, Macroeconomics, 8e, Pearson.

## Rational Expectations: Lucas Critique <sup>(w)</sup>

Robert E. Lucas Jr. (1995 Nobel laureate) developed and applied the hypothesis of rational expectations, and thereby transformed macroeconomic analysis and deepened our understanding of economic policy.

<https://www.nobelprize.org/prizes/economic-sciences/1995/summary/>

- Rational expectations undermines the idea that policymakers can manipulate the economy by systematically "fooling" the public.
- Lucas showed that if expectations are rational, it simply is not possible for the government to manipulate those forecast errors in a predictable and reliable way for the very reason that the errors made by a rational forecaster are inherently unpredictable.
- Lucas's work led to what has sometimes been called the "policy ineffectiveness proposition." If people have rational expectations, policies that try to manipulate the economy by inducing people into having false expectations may introduce more "noise" into the economy but cannot, on average, improve the economy's performance.

<https://www.econlib.org/library/Enc/RationalExpectations.html>

## New Classical Macroeconomics (w)

The new classical macroeconomics originated in the early 1970s in the work of economists centered at the Universities of Chicago and Minnesota—particularly, Robert Lucas (1995 Nobel laureate), Thomas Sargent (2011 Nobel laureate), Neil Wallace, and Edward Prescott (2004 Nobel laureate).

- The research agenda of the new classical theorists consists of an attempt to explain macroeconomic fluctuations as the outcome of shocks to competitive markets with fully flexible wages and prices. These so-called real business cycle models assume that output is always at its natural level, and interpret fluctuations as arising from movements in the natural level, triggered by technological changes.
- The problem with this view is that the nature of technological progress does not seem consistent with the types of output fluctuations typically associated with business cycles. Moreover, although in real business cycle models the money supply is irrelevant to output, there is strong evidence that changes in money affect output.

# Keynesian vs New Classical Macroeconomics

	Keynesian macroeconomics	New classical macroeconomics
1. The overarching aim of macroeconomics	explaining unemployment	explaining the business cycle
2. Basic model	the IS-LM model	the Lucas-Rapping supply function
3. Relative role of supply and demand	emphasis on demand	emphasis on supply
4. The wage-employment relationship	stable Phillips curve allowing the policy exploitation of the inflation/unemployment inverse relation	no possibility of a policy exploitation of the inflation/unemployment inverse relation
5. Micro/macro relationship	under the mantle of the neoclassical synthesis; macroeconomics is concerned with its disequilibrium short-period leg	rejection of the neoclassical synthesis; its equilibrium long-period leg can provide all the explanation necessary
6. Expectations	adaptive expectations	rational expectations
7. Econometric modelling	Keynesian macroeconomic models are complex systems of equations, whose parameters are fixed by economically-estimated coefficients	Models are simplified general equilibrium models which ought to be based on 'deep structural' parameters based on the calibration method
8. Methodology	Marshallian	Walrasian
9. The nature of the business cycle and policy conclusions	the business cycle is viewed as a market failure — the policy aim is to bring the economy towards full employment through demand activation	fluctuations express agents' optimising reaction to exogenous shocks — no activation policy should be undertaken

Source: De Vroey and Malgrange (2011)

## New Keynesian Economics (w)

In the 1980s, in response to the new classical critique of the 1970s, New Keynesian economics evolved with adjustments to the Keynesian tenets.

- The primary disagreement between New Classical and New Keynesian economists is over how quickly wages and prices adjust.
- New Keynesian theories rely on the stickiness of wages and prices to explain why involuntary unemployment exists and why monetary policy has such a strong influence on economic activity.
- The elements of New Keynesian Economics—such as menu costs, staggered prices, coordination failures, and efficiency wages—represent substantial deviations from the assumptions of Classical Economics, which provides the intellectual basis for the justification of laissez-faire.
- At the broadest level, new Keynesian economics suggests that recessions are departures from the normal efficient functioning of markets and caused by some economy-wide market failure. Thus, new Keynesian economics provides a rationale for government intervention.

<https://www.econlib.org/library/Enc/NewKeynesianEconomics.html>

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- [1] Abel, Bernanke, and Croushore (2020) Macroeconomics, 10e, Pearson.
- [2] Acemoglu, Laibson, and List (2022) Macroeconomics, 3e, Pearson.
- [3] Bade and Parkin (2021) Foundations of Macroeconomics, 9e, Pearson.
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- [5] Mankiw (2021) Principles of Economics, 9e, Cengage.
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- [7] Olivier Blanchard (2021) Macroeconomics, 8e, Pearson.
- [8] M. De Vroey and P. Malgrange (2011) The History of Macroeconomics from Keynes's General Theory to the Present. Discussion Paper 2011-28.

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<https://www.econlib.org/library/Enc/bios/Keynes.html>

[2] Great Depression By Gene Smiley

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[3] Keynesian Economics By Alan S. Blinder

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