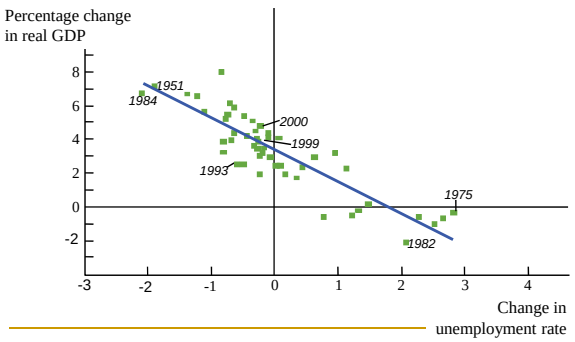
Introduction to Macroeconomics

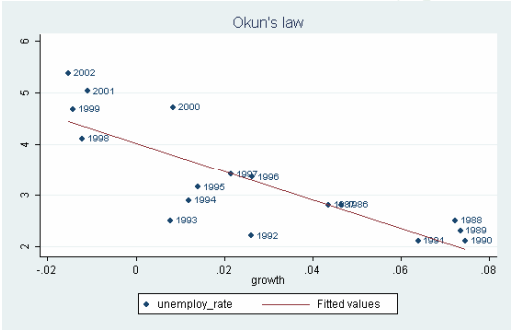
Why do we study Macroeconomics?

- Okun's law
- Relationship between unemployment and social well-being
- Situation in Japan

Okun's Law(US Data)



Okun's law (time series data in Japan)



Growth and social situation

1. The macroeconomy affects society's well-being.
   - *example:* Unemployment and social problems

Each one-point increase in the u-rate is associated with:
- 920 more suicides
- 650 more homicides
- 4000 more people admitted to state mental institutions
- 3300 more people sent to state prisons
- 37,000 more deaths
- increases in domestic violence and homelessness

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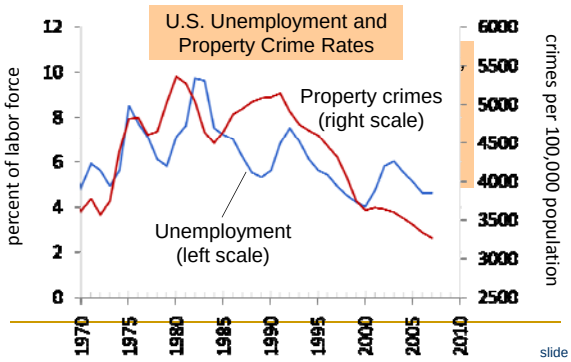
Why learn macroeconomics?

1. The macroeconomy affects society's well-being.



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Japanese situation

- GDP growth rates in the past 20 years do not look good
- Japanese government debt
- Tax expenditure vs. tax revenue

- Japanese GDP per capita compared with other countries (PPP) based

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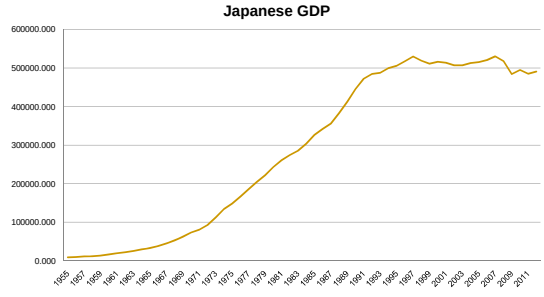
Japanese GDP: time series data



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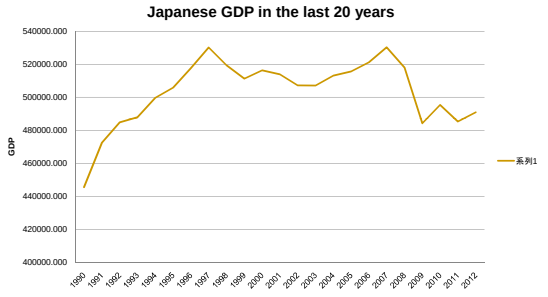
Japanese GDP in the last 20 years



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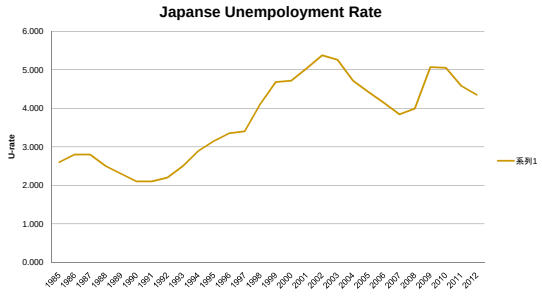
Japanese unemployment rate



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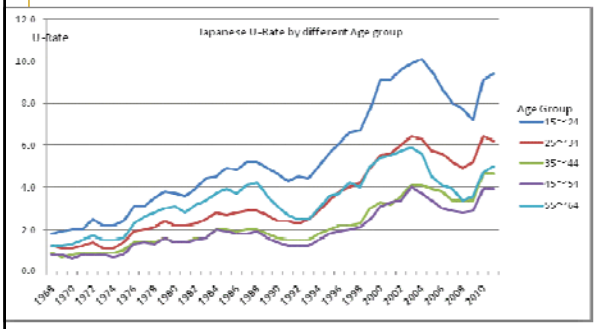

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International GDP comparison

- https://www.cia.gov/library/publications/the-world-factbook/rankorder/rankorderguide.html

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PPP

- PPP is another method to convert foreign prices to internationally comparable prices.
- Let one bottle of coke be $2 in the US and let it be 220 yen in Japan. Under what exchange rate are the prices of coke the same in US and JPN? It is when $1=110 yen.
- Then this $1=110 yen is called Purchasing power parity based exchange rate. (購買力平価による為替レート)

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GDP

- Motivation of using GDP
- We want to measure economic activity.
- We want to measure income of the economy

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Simple Intuition

- What is economic activity?
- Goods and service produced.
- How to measure it ?
- Total sales of goods and service.
- Total Sales=price times quantity
- GDP is trying to measure goods and service produced.

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Definition of Profit

Accounting profit=total sales

-labor cost(payment to workers)

–interest payment (payment to capital owner)

-depreciation (genkashoukyaku)

–tax on producer

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Depreciation

- Capital depreciation is the decrease of the usefulness of capital when it is used or the time passes.
- Capital depreciation is important because in the accounting rule of any countries, depreciation should be accounted as an important factor of cost although the firm is not paying such a cost through cash payment.

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Distribution of Accounting profit

- Accounting profit=dividend (haitou) +retained earning(naibu ryuho)

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Relationship between total sales and income

Accounting profit

+labor cost(payment to workers)

+ interest payment (payment to capital owner)

+depreciation (genkashoukyaku)

+tax on producer=total sales

But accounting profit is dividend +retained earning

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GDP and Income

- Retained earning +dividend+interest income
- +labor income+depreciation+tax on producer=total sales
- But the total sales =price*quantity=GDP
- Thus,
- GDP=capital owner's income+labor's income+depreciation +tax on producer

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GDP and Income

- Total good and service produced is equal to income earned in this economy +depreciation +tax
- In other words, GDP measures not only good and service produced but also measures the income earned in this economy +depreciation
- +tax
- GDP-depreciation=total income earned in this economy +tax
- What happen when there are intermediate goods ?

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Value added

definition:

A firm's **value added** is
the value of its output
minus
the value of the intermediate goods
the firm used to produce that output.

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Treatment of intermediate goods

- A farmer grows a bushel of wheat and sells it to a miller for $1.00.
- The miller turns the wheat into flour and sells it to a baker for $3.00.
- The baker uses the flour to make a loaf of bread and sells it to an engineer for $6.00.
- The engineer eats the bread.

Compute

- *Sum of all sales*

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GDP and Intermediate goods

- Sum of all sales in the previous slide =1+3+6=10dollar
- However, in this economy, it is not like 10 dollar value is produced. For example, in the last stage, what is produced in net is 2 dollar.
- It is important to abstract the value of intermediate goods from total sales to correctly measure goods and service produced.

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Value added and intermediate goods

- Value added of the farmer is 1 dollar. The value added of miller is 2 dollar. The value added of baker is 3 dollar.
- Thus, total value added of this economy is 6 dollar.
- For calculation of GDP, we subtract the value of intermediate goods from the total sales.
- Thus, GDP is trying to measure the sum of all value added of the all production.

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GDP and value added

- GDP=total income earned in this economy +depreciation +tax on producer
- GDP=sum of all valued added at each production

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More accurate calculation of GDP

- Sum of all income including profit and wages+ tax on production +depreciation=GDP

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Looking at the Japanese GDP from macroeconomics point of view

- Japanese GDP is about 500 trillion yen.
- It is 3nd largest economy in the world. It consist of about 11% of the world economy.
- US is the largest economy and 28% of the world economy. Fourth is Germany
- However, the picture becomes different if we compare GDP through PPP.

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PPP

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Looking at the data(National Income Accounting)

- Page 173 of NIA, sum of valued added of all sectors is 515.804 trillion yen
- Page 91 of NIA, compensation of employee=264 tri.yen. Operating surplus and mixed income=94 tri.yen. Capital depreciation(consumption of fixed capital)=107 tri.yen. Taxes on production=43 tri.yen.
- What is the sum of all ?
- 515.804

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Looking at the data (2)

- All goods and service produced will be used for priviate consumption, investment for future, government expenditure or export.
- In page 137 of NIA, private consumption is 290 tri.yen. Gov.expenditure is 92 tri.yen. Investment for firm(Gross capital formation) is 124 tri.yen. Net export is 8 .6 tri.yen.
- What is the sum of all components?
- 515.804 tri. yen

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The expenditure components of GDP

- consumption
- investment
- government spending
- net exports

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Consumption (C)

def: the value of all goods and services bought by households. Includes:

- ***durable goods***
  last a long time
  ex: cars, home appliances
- ***non-durable goods***
  last a short time
  ex: food, clothing
- ***services***
  work done for consumers
  ex: dry cleaning, air travel.

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Investment (I)

def1: spending on [the factor of production] capital.
=spending on goods bought for future use.

Includes:

- ***(business) (non-residential) fixed investment***
  spending on plant and equipment that firms will use to produce other goods & services
- ***residential fixed investment***
  spending on housing units by consumers and landlords
- ***inventory investment***
  the change in the value of all firms' inventories

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Japanese Investment 2007

item	amount(trillion yen)	% of GDP
private residential	17.3	3.35
private non-residential	82.7	16.03
public residential	0.6	0.12
public non-residential	20	3.88
change in invetntory	3.6	0.70

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U.S. Investment, 2003

	$ billions	% of GDP
Investment	$1,670.6	15.2%
Business fixed	1,110.6	10.1
Residential fixed	562.4	5.1
Inventory	-2.4	-0.02

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Investment vs. Capital

- Capital is one of the factors of production. At any given moment, the economy has a certain overall stock of capital.
- Investment is spending on new capital.

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Investment vs. Capital

Example *(assumes no depreciation)*:

- 1/1/2004:
  economy has $500b worth of capital
- during 2004:
  investment = $37b
- 1/1/2005:
  economy will have $537b worth of capital

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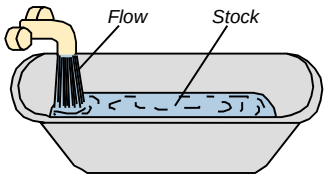
Stocks vs. Flows

A **stock** is a quantity measured at a point in time.

We might say "the U.S. capital stock was $25.4 trillion as of December 6, 2003."



A **flow** is a quantity measured per unit time.

"U.S. investment was $1.6 trillion in 2001."

FYI: "Flow" means the same thing as "rate"

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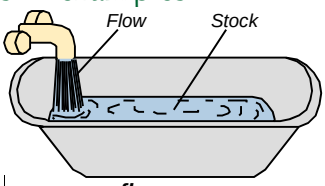
Stocks vs. Flows - examples



stock	***flow***
a person's wealth	a person's annual saving
# of people with college degrees	# of new college graduates
the govt. debt	the govt. budget deficit

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Now you try:

Stock or flow?

The balance on your credit card statement.

How much you study economics outside of class.

The size of your compact disc collection.

The inflation rate.

The unemployment rate.

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Government spending (G)

- **G** includes all government spending on goods and services.
- **G** excludes transfer payments (e.g. unemployment insurance payments), because they do not represent spending on goods and services.

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Government spending of the US, 2003

	$ billions	% of GDP
Gov spending	$2,054.8	18.7%
Federal	757.2	6.9
Non-defense	259.9	2.4
Defense	497.3	4.5
State & local	1,297.6	11.8

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Looking at the data(3)

- How does our Japanese government use our income?
- Jpn gov. expenditure in GDP use is 89 trillion yen.
- Look at the NIA account. On this table, the size of the use on social security and welfare seems small. But this does not reflect the truth.
- Involvement of the government in social security is substantial. (Look at the handout)

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An important identity

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

where
Y = GDP = the value of total output
C + **I** + **G** + **NX** = aggregate expenditure

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A question for you:

Suppose a firm
- produces $10 million worth of final goods
- but only sells $9 million worth.

Does this violate the
expenditure = output identity?

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Why output = expenditure

- Unsold output goes into inventory,
  and is counted as "inventory investment"...
  ...whether the inventory buildup was
  intentional or not.
- In effect, we are assuming that
  firms purchase their unsold output.

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GNP vs. GDP

- Gross **National** Product (GNP):
  total income earned by the nation's factors of
  production, regardless of where located
- Gross **Domestic** Product (GDP):
  total income earned by domestically-located
  factors of production, regardless of nationality.

  (GNP – GDP) = (factor payments from abroad)
  – (factor payments to abroad)

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Discussion Question:

In your country,
which would you want
to be bigger, GDP or GNP?

Why?

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(GNP – GDP) as a percentage of GDP

selected countries, 2002

U.S.A.	1.0%
Angola	-13.6
Brazil	-4.0
Canada	-1.9
Hong Kong	2.2
Kazakhstan	-4.2
Kuwait	9.5
Mexico	-1.9
Philippines	6.7
U.K.	1.6

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