

Macroeconomic Indicators: What They Are & How to Use Them

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Macroeconomic Indicators

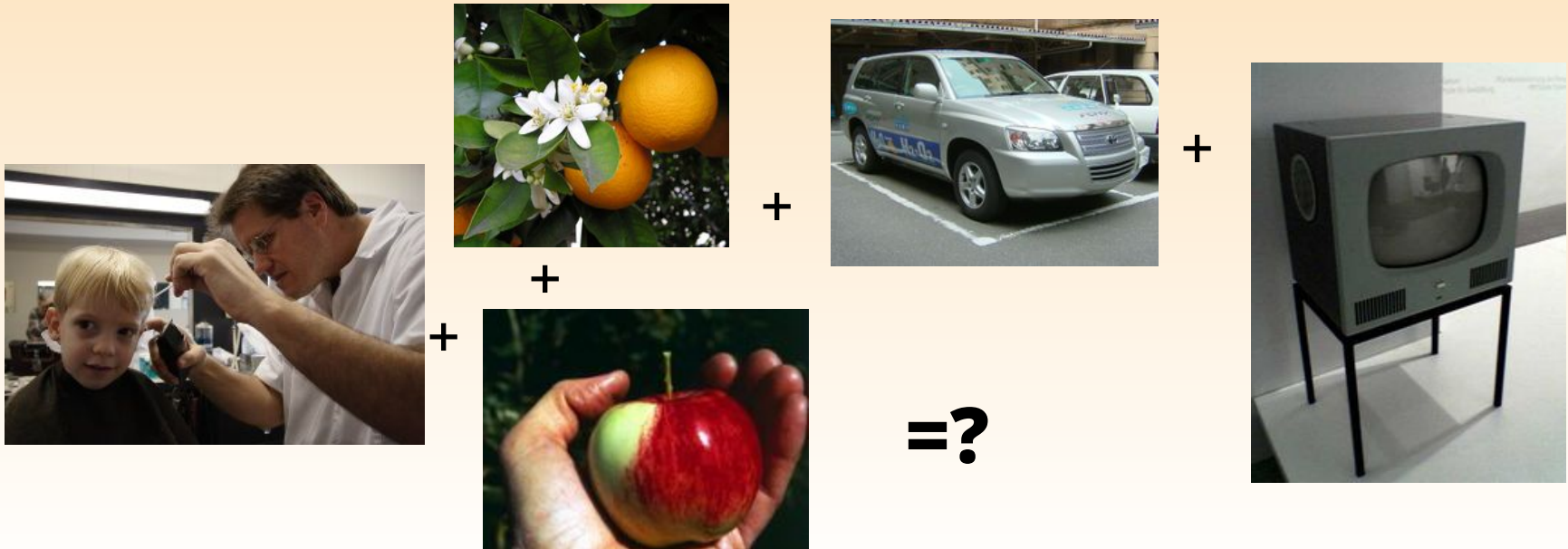
- Production: GDP, GNP, NI
- Business Cycles
- Inflation
- Unemployment
- Interest Rates

Quantity Aggregates

- To understand the macroeconomy, we need to measure it.

Chief measure of economy is the level of production

- We need to combine the many goods produced or consumed in an economy into one measure.



All goods sold in an economy share a common unit of measure: the price at which they are sold.

Sum up
the value
of goods



Gross Domestic Product (GDP)

- *GDP* is the sum of the value of new, final goods produced within the domestic borders of an economy.

Final goods are goods sold to their end-users

Three Methods for Calculating GDP

1. Expenditure Method - The sum of the domestic spending on final goods (less domestic demand satisfied by imports).
2. Production Method - The value added created in all the sectors of the economy.
3. Income Method – The Wage, Rent, Interest and Profit Income generated by the domestic economy.

Expenditure Method

<u>C</u> +	C onsumption	Consumer durables, non-durables, services
<u>I</u> +	I nvestment	Structures (incl. Residential), Equipment, and Inventory
<u>G</u> +	G overnment C onsumption	Government Spending on Goods, Services, and Salaries.
<u>X</u> -	EX ports	Goods & Services Shipped Abroad
<u>IM</u>	IM ports	Goods & Services from Abroad
=	<u>GDP</u>	$A + NX = (C + I + G) + (X - IM)$

Japanese Expenditure

Fiscal Year (Billion Yen)	2003	
Items		
Actual final consumption of households [C]	332,970.6	66.43%
Government actual final consumption [G]	38,578.9	7.70%
Gross domestic fixed capital formation [I]	120,238.8	23.99%
Of which intangible fixed assets	10,810.2	2.16%
Changes in inventories	270.0	0.05%
Exports of goods and services [X]	60,375.7	12.04%
(less) Imports of goods and services	(51,180.5)	10.21%
Gross domestic expenditure	501,253.5	100.00%
(cf) Incomes from the rest of the world	12,787.4	
(less) Income to the rest of the world	4,001.1	
Gross national income	510,039.8	

GNP vs. GDP

GNP	GDP
Gross National Product	Gross Domestic Product
= income earned by domestic residents	= income created within national borders.
$\text{GNP} = \text{GDP} + \text{NFI}$	

- Net Factor Income [NFI] is income earned on overseas work or investments minus income generated domestically but paid to foreigners.

Compare Macau and the Philippines GDP or GNP

- *Macau produces a lot of profits paid to overseas owners of casinos.*
- *Philippines workers earn a lot of income overseas.*
- *Which is larger Philippines' GDP or Philippines GNP?*
- *Does Macau have greater GDP or GNP?*

Comparing GDP levels across time

- GDP measures the value of the goods produced by an economy by using the market price of each good to assign it a value.
- Problem: Prices of goods in terms of money are changing overtime making comparisons in overall value difficult.
 - Bias: Money prices are growing over time as money supply grows.
- Solution: Choose a Base Year's prices as a fixed yardstick of value for different goods.

Real GDP: Y_t

- *GDP or Nominal GDP or Current Dollar GDP* is the weighted sum of the number of goods produced using their current prices as the weight.
- *Real GDP or Constant Dollar GDP or GDP adjusted for inflation* is the weighted sum of the number of goods produces using the Base Year prices as yardsticks.

Solved Problem

Real GDP: 2021 (2020 Base Year)

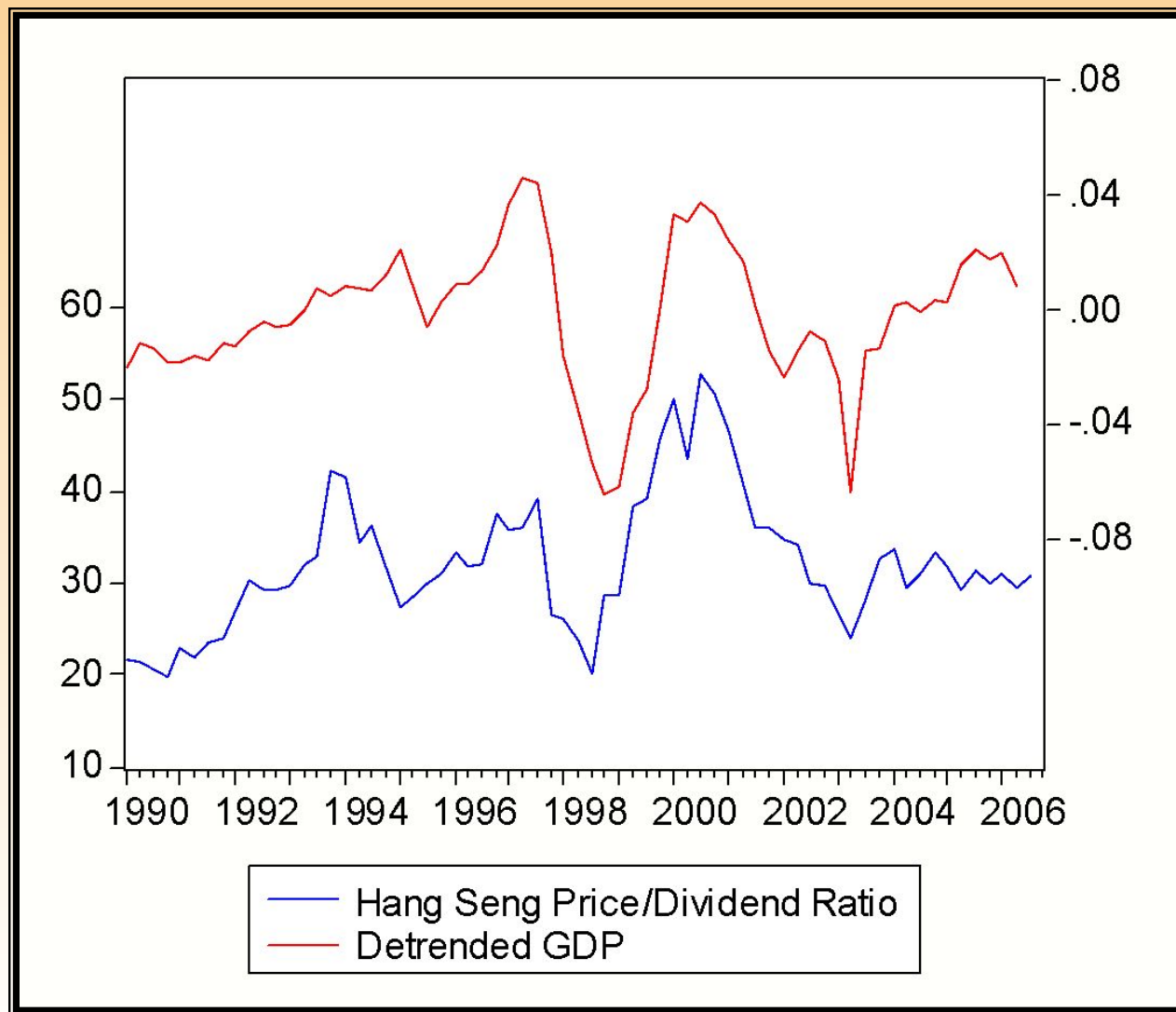
	2020		2021	
	P	Q	P	Q
Kitkat	8	150	6	135
M&Ms	10	150	4	135
Nominal GDP				
Real GDP				



Recessions and Expansions

- Business cycle positions are sometimes characterized as booms and recessions.
- These names have many definitions
 - An expansion occurs roughly when real GDP is above the trend growth path (detrended output is positive).
 - A recession occurs roughly when real GDP is below trend growth.
 - In the USA, recessions are sometimes defined as 2 consecutive periods of negative growth.

Stock Market tends to co-move positively with the business cycle.



The Seasons of the Economic Cycle

While the U.S. economy has grown over time, the growth has not been in a straight line. The variations in the pace of growth around the long-term trend are called economic cycles, which have four distinct stages.



Price Indices: P_t

- Two most commonly used price indices are *GDP Deflator* and *Consumer Price Index (CPI)*
- The GDP deflator is the ratio of nominal GDP to Real GDP (multiplied by 100).

$$P = \text{GDP Deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$$

$$P = \frac{GDP}{Y} \times 100$$

Consumer Price Index

- The CPI is the price of a representative market basket of goods relative to the price of that same basket during a benchmark/base year (multiplied by 100).

$$CPI_t = \frac{\text{Cost of Market Basket in year } t}{\text{Cost of Market Basket in Base year}} \times 100$$

Q: What is Inflation?

A: The Growth Rate of Price Level

$$\text{Inflation Rate} = \frac{P_t - P_{t-1}}{P_{t-1}} \times 100\%$$

Inflation: prices are growing

Disinflation: inflation is slowing down but still positive

Deflation: inflation is negative and prices are actually dropping.

Adjusting for Inflation

- We can use some price index to “adjust for inflation” effectively converting a variable measured in money (nominal) into a variable measured in the prices of some reference year.
- Real series measures the value of goods that could have been purchased with that amount of money in the reference year.

Converting Current Price Series into Constant Price Series

- Series to be adjusted for inflation: N_t
- Contemporaneous price level (P_t) and comparable price level in reference year (P_{Ref})
- Series adjusted for inflation – (i.e. how much that the goods that you could have bought with N in year t would cost in year Ref .)

$$N_t^{Ref\$} = N_t \times \frac{P_{Ref}}{P_t}$$

Housing Price: Hong Kong Island

- Compare the price of housing in HK
average price of an apartment on HK
Island with an area between 100m^2 and
 160m^2
 - in December 2005 : HK\$112,012/ m^2
 - in December 1982: HK\$14,742/ m^2
- How much did an apartment cost back
then when expressed in today's dollars?

Housing Price: Hong Kong Island

- The Hong Kong CPI (2000=100) was 35.5 in December 1982 and 94.5 in December 2005.
- Calculate:

$$N_t^{\text{Real}} = N_t \times \frac{P_{\text{Ref}}}{P_t} = 14,742 \frac{94.5}{35.5} = 39,242.79$$

- In real, terms, housing today is almost 3 times as expensive as in 1982!

Example

- Compare the box office take of “Shrek 2” and “Sound of Music” in 2004 dollars.

Movie		Year	Box Office	P
Shrek 2		2004	436,471,036	189
Sound of	Music	1965	163,214,286	32

Interest Rates

- What are some major interest rates in financial markets? Be as specific as possible.

Nominal and Real Interest Rates

- Nominal return represents how much money you will receive after 1 year for giving up 1 dollar of money today
- Real return represents how many goods you can buy if you give up the opportunity to buy 1 good today.
- Nominal interest rate is *money* interest rate. Real interest rate is *goods* interest rate.

- Imagine a 1 year loan [$T = 1$]: The lender gives up some goods to make a loan and will buy goods in the future with the repayment.

$$1 + i_t = \frac{Repayment_{t+1}}{Principal_t}$$

- If the price of goods at time t is P_t , the foregone current goods are

$$Principal_t / P_t$$

- The goods value of the future repayment is

$$\frac{Repayment_{t+1}}{P_{t+1}}$$

Real Interest Rate

- The real interest rate on the loan is defined as the future goods received relative to current goods foregone

$$1 + r_t \equiv \frac{\text{Repayment}_{t+1} / P_{t+1}}{\text{Principal}_t / P_t} = \frac{\text{Repayment}_{t+1} / \text{Principal}_t}{P_{t+1} / P_t}$$

$$1 + r_t = \frac{1 + i_t}{1 + \pi_{t+1}} \rightarrow r_t \approx i_t - \pi_{t+1}$$

Ex Ante Rate and the Fisher Effect

- Savings and investment decisions must be made before future inflation is known so they must be made on the basis of an ex ante (predicted) real interest rate.
- Fisher Hypothesis: Ex ante real interest rate is determined by forces in the financial market. Money interest rate is just the real ex ante rate plus the market's consensus forecast of inflation.

$$\dot{i}_t = r_t^{EA} + \pi_{t+1}^{FORECAST}$$

Learning Outcomes

- Students should be able to:
- Calculate simple real aggregates like real GDP.
- Use price indices to calculate inflation rates and real interest rates.
- Adjust nominal series for inflation.