Chapter 2. Macroeconomic Measurement

EE312 : Supplementary 1

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January 2014

- Only value of final sale is counted.
- We do not count auto parts in a new car.
- Auto parts in a new car are intermediate goods.

- The tires that come with the car is not counted as a final good.
- However if you get a flat and buy the same tire it is counted as a final good.
- This is confusing. We use “Value Added Approach” to avoid double counting.

- Final goods include both consumption goods and capital goods.

- The equipments used in producing a car are not included in the value of a car as an intermediate goods.
- Newly produced equipments are counted in GDP as final goods.

Example :

Farmer	unmilled rice grains	100
Mill	milled rice grains	120
Wholesaler	milled rice grains in big bags	200
Retailer	milled rice grains in small bags	250

Example : Real output VS. Nominal output

- Nominal output measures these values using current prices.
  - Real output measure these values using the prices of a base year.

	2005			2013		
	P	Q	P_tQ_t	P	Q	P_tQ_t
A	50	100	5,000	60	50	3,000
B	100	50	5,000	90	100	90,000
total			10,000			12,000

- 2005 = base year

$$
\begin{aligned}
rGDP^{2005} &= \sum_i P_i^{\cdots\cdots} Q_i^{\cdots\cdots} \\
&= 10,0000 \\
\\
rGDP^{2013} &= \sum_i P_i^{\cdots\cdots} Q_i^{\cdots\cdots} \\
&= (\ldots\ldots\ldots \times 50) + (\ldots\ldots\ldots \times 100) \\
&= 2500 + 10,000 \\
&= 12,500 \\
rg &= 25\%
\end{aligned}
$$

- 2013 = base year

$$
\begin{aligned}
rGDP^{2013} &= \sum_i P_i^{\cdots\cdots} Q_i^{\cdots\cdots} \\
&= 12,000
\end{aligned}
$$

$$
\begin{aligned}
rGDP^{2005} &= \sum_i P_i^{\cdots\cdots} Q_i^{\cdots\cdots} \\
&= (\ldots\ldots\ldots \times 100) + (\ldots\ldots\ldots \times 50) \\
&= 6,000 + 4,500 \\
&= 10,500 \\
rg &= 14.29\%
\end{aligned}
$$

- “substitution bias”

- “A geometric mean is often used when comparing different items – finding a single "figure of merit" for these items – when each item has multiple properties that have different numeric ranges.
- “For example, the geometric mean can give a meaningful "average" to compare two companies which are each rated at 0 to 5 for their environmental sustainability, and are rated at 0 to 100 for their financial viability. If an arithmetic mean was used instead of a geometric mean, the financial viability is given more weight because its numeric range is larger- so a small percentage change in the financial rating (e.g. going from 80 to 90) makes a much larger difference in the arithmetic mean than a large percentage change in environmental sustainability (e.g. going from 2 to 5). The use of a geometric mean "normalizes" the ranges being averaged, so that no range dominates the weighting, and a given percentage change in any of the properties has the same effect on the geometric mean. So, a 20% change in environmental sustainability from 4 to 4.8 has the same effect on the geometric mean as a 20% change in financial viability from 60 to 72.”

- “The profit of Company A, SYZO Ltd., has grown over the last three years by 10 million, 12 million, and 14 million dollars. It is appropriate to say that it has grown by an average of 12 million dollars yearly, for which we use the arithmetic mean.
- The profit of Company B, OZYS Ltd., has grown the over last three years by 2.5%, 3%, and 3.5%. Here we cannot use the arithmetic mean and say that the average growth was 3%. Why not?
  Suppose that Company B, OZYS Ltd., started with a 100-million-dollar profit. Three years later it will have become:
  $100,000,000 * 1.025 * 1.03 * 1.035 = $109,270,125
  This is less than a yearly increase of 3% would yield, since:
  $100,000,000 * 1.03 * 1.03 * 1.03 = $109,272,700.”