

Measuring the economy: GDP, prices and what the number leaves out

The ideas in six lines

1. **GDP** is the market value of all *final* goods and services produced in a country in a period.
2. Count **final** goods only. Inputs (flour, a firm's software) are already inside the final price.
3. **Value added** = sales – inputs bought. Adding value added over all producers gives GDP.
4. Production, spending and income are three ways to measure the same total.
5. **Nominal GDP** uses this year's prices. **Real GDP** uses fixed base-year prices.
6. GDP counts market production only. Free services, home production and leisure are not in it.

The formulas

$$\text{GDP} = \sum \text{value added} = C + I + G + (X - M)$$

$$\text{GDP deflator} = \frac{\text{nominal GDP}}{\text{real GDP}} \times 100$$

$$1 + \text{nominal growth} = (1 + \text{real growth}) \times (1 + \text{inflation})$$

So nominal growth $\approx$ real growth + inflation.

Worked example

Farmer sells wheat for 20. Miller sells flour for 50. An AI firm sells the baker a tool for 10. Baker sells bread for 100.

Producer	Sales	Inputs	Value added
Farmer	20	0	20
Miller	50	20	30
AI firm	10	0	10
Baker	100	60	40
Total	180		100

GDP = 100, the value of the bread. Not 180.

Nominal GDP +7.1%, prices +5%: real growth = $1.071/1.05 - 1 = 2.0\%$.

Four traps

- “Add up all the sales.” No. That counts inputs more than once.
- “GDP grew 7%, so we make 7% more.” Only if prices did not change.
- “A useful free service raises GDP.” Not directly. Its market price is zero.
- “A used car sold this year counts.” No. It was counted when it was made.

Words to know

final good · intermediate good · value added · nominal GDP · real GDP · GDP deflator · base year

Try these

1. Wheat is sold for 15, flour for 40, and bread for 90 to households. How much do these activities add to GDP?
2. A bakery buys flour for 50 and an AI tool for 12. It sells bread for 100. What is the bakery's value added?
3. Which counts in this year's GDP: (a) a second-hand bike sold this year, (b) a new phone bought by a household, (c) a free AI chat service?
4. Nominal GDP grows by 6% and the GDP deflator by 4%. What is real growth? (One decimal.)
5. Real GDP grows by 3% and prices by 2%. What is nominal growth, exactly? (Two decimals.)
6. Nominal GDP is 1,100. Real GDP at base-year prices is 1,000. What is the GDP deflator?

Answers

1. 90 — the final good. Check: $15 + 25 + 50 = 90$.
2. $100 - 50 - 12 = 38$.
3. Only (b). The bike was counted when new; the free service has a market value of zero.
4. $1.06/1.04 - 1 = 1.9\%$.
5. $1.03 \times 1.02 - 1 = 5.06\%$.
6. $1,100/1,000 \times 100 = 110$.