Deflating GDP

How to Remove the Effects of Inflation

"Deflating" Nominal Values

- Price Index:
 - Ratio of Prices "Now" vs. "Then"
 - "Now & Then" Arbitrarily Chosen- "Then" is the "Base Year"
- "Base Year" Defines (Constant) Value of Dollar
- "GDP Deflator"
 - Measure of the Price Level; "Overall Prices"
 - Calculated as Ratio of Nominal GDP to Real GDP

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

Shows Rise in Nominal GDP Due to Rising Prices vs. Rising Quantities

GDP Price Deflator

- Calculated by Government (So is Real GDP)
- Available to Everyone
- "Deflating" Means Converting to:
 - "Constant Dollars"
 - Say, for example: "2001 Dollars"
 - (Choose Base Year for Convenience)
 - "Chained 2001 Dollars"

Deflating Using GDP Price Deflator

- Adjusting Nominal to Real
- Nominal Adjusted by Ratio of Prices

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

• Text Approach:

Real GDP₂₀₀₄ = $\frac{\text{Nominal GDP}_{2004}}{\text{GDP deflator}_{2004}} \times 100$

My Preference:

Real GDP₂₀₀₄ = Nominal GDP₂₀₀₄ X GDP deflator₂₀₀₁ GDP deflator₂₀₀₄

Example: Deflating GDP

• U.S. Data: Billions of \$ (Real is "Chained 2000 \$")

	GDP	GDP		
Year	Nominal	Real	Deflator	
2000	9,817.0	9,817.0 → 9,890.7 → 10,074.8 →	100.0	2.4%
2001	10,128.0	9,890.7 →	102.4	1.7%
2002	10,487.0	10,074.8 →	104.1	1.7%
2003	11,004.0	10,381.3 →	106.0	1.8%
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Nominal Price Ratio Real 10,128.0 * (100.0/102.4) = 9,890.7

\$11,004,000,000,000

Wrap Up:

- Mechanics of "Deflating"...Removing Inflation
- Converting Nominal Values to Real
- Choose a Formula:

$$\label{eq:Real_GDP_2004} \begin{aligned} \text{Real GDP}_{20\mathbf{04}} &= \frac{\text{Nominal GDP}_{20\mathbf{04}}}{\text{GDP deflator}_{20\mathbf{04}}} \times 100 \\ \\ \text{Real GDP}_{2004} &= \text{Nominal GDP}_{2004} \, \text{X} \left(\begin{array}{c} \text{GDP deflator}_{2001} \\ \text{GDP deflator}_{2004} \end{array} \right) \end{aligned}$$