Unit 2: Master Formula & Accounting Quick-Reference

Unit 2 Review | CED 2.1–2.7

1. National Output Accounting (GDP)

```
GDP = C + I_g + G + X_n (Expenditures Approach)
```

- **C (Consumption):** Durables, non-durables, consumer services.
- **I_g (Gross Investment):** Capital goods + Residential construction + ΔInventory.
- **Net Investment (I_n):** I_g − Depreciation. (If I_g > Dep, capital stock grows!).
- **G (Gov Purchases):** Real final goods & services (Excludes transfers!).
- **X_n (Net Exports):** Exports (X) − Imports (M).
- **Income Approach:** GDP = W + R + i + PR + Indirect Taxes + Depreciation.
- **Strict Exclusions:** Intermediate goods, transfer payments, stock/bond trades, secondhand goods, non-market/underground work.

2. Real vs. Nominal GDP & Deflator

```
Nominal = ∑(P_current × Q_current) | Real = ∑(P_base × Q_current)
```

- **Base Year Invariant:** Nominal GDP ≡ Real GDP and Deflator ≡ 100.
- **GDP Deflator Formula:**
  GDP Deflator = (Nominal GDP / Real GDP) × 100.
- **Deflating Nominal to Real:**
  Real GDP = (Nominal GDP / GDP Deflator) × 100.
- **Real Economic Growth Rate:**
  %Δ Real GDP = [(Real_t − Real_{t−1}) / Real_{t−1}] × 100.
- **Deflator Inflation Rate:**
  Inflation = [(Deflator_t − Deflator_{t−1}) / Deflator_{t−1}] × 100.

3. Labor Market & Unemployment

```
Unemployment Rate (u) = [Unemployed / Labor Force] × 100
```

- **Labor Force (LF):** Employed (E) + Unemployed (U).
- **Labor Force Participation Rate (LFPR):**
  LFPR = [Labor Force / Civilian Working-Age Pop (16+)] × 100.
- **Natural Rate of Unemployment (NRU):** NRU = Frictional + Structural.
- **Cyclical Unemployment (u_c):** Actual Rate (u) − NRU.
- **Full Employment Output (Y_f):** Occurs when u_c = 0% (Actual u = NRU).
- **Understatement Traps:** Discouraged workers (NILF) and involuntary part-time workers (counted as employed) understate true slack.

4. Inflation, CPI & The Fisher Effect

```
CPI_t = (Cost of Basket in Year t / Cost in Base Year) × 100
```

- **Annual Inflation Rate:** [(CPI_t − CPI_{t−1}) / CPI_{t−1}] × 100.
- **The Fisher Equation:**
  Real Rate (r) = Nominal Rate (i) − Inflation Rate (π)
  Nominal Rate (i) = Real Rate (r) + Expected Inflation (π^e).
- **Real Wage Growth:** %Δ Real Wage ≈ %Δ Nominal Wage − π.
- **Unanticipated Inflation (π > π^e):**
  • *Helped (Winners):* Borrowers/Debtors (repay in cheaper $).
  • *Hurt (Losers):* Lenders/Creditors, Savers, Fixed-income retirees.

5. Output Gaps & Business Cycle Alignment

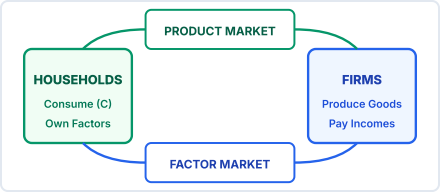
```
Output Gap = [(Actual Real GDP (Y) - Potential GDP (Y_f)) / Potential GDP (Y_f)] × 100
```

Recession Criterion: ≥ 2 consecutive quarters of declining Real GDP

Phase / Gap	Real GDP vs. Potential	Actual Unemployment vs. NRU	Cyclical Unemployment	Price Pressures
Recessionary Gap	Y < Y_f (Negative)	Actual u > NRU	u_c > 0% (Labor idle)	Disinflationary / Deflationary
Full Employment	Y = Y_f (Zero Gap)	Actual u = NRU	u_c = 0% (No cyclical)	Price Stability / Target Inflation
Inflationary Gap	Y > Y_f (Positive)	Actual u < NRU	u_c < 0% (Over-employed)	Demand-Pull Inflationary Pressure

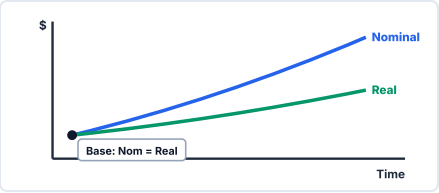
Unit 2: Essential High-Yield Macro Visual Models

Model 1: Circular Flow of Output & Income



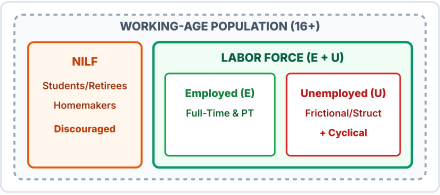
Expenditures on products strictly equals factor incomes paid.

Model 2: Nominal vs. Real GDP Divergence



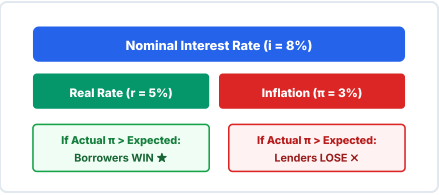
Gap between curves isolates pure inflation impact.

Model 3: Labor Force Demographic Tree



Rate = U / (E + U) × 100. NILF omitted from denominator.

Model 4: The Fisher Effect & Loan Payoffs



Real rate earned equals nominal interest rate minus inflation.

Model 5: The Master Business Cycle Curve & Output Gaps

