

Formula Sheet: Final
Econ 3133
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$$\text{GDP} = C + I + G + (X - \text{IM})$$

$$\text{National income} = \text{Employee compensation} + \text{Corporate profits} + \text{Proprietors' income} + \text{Rental income of persons} + \text{Net interest}$$

$$\text{Net national product} = \text{National income} + \text{Sales and excise taxes} + \text{Business transfers} - \text{Net subsidies to government businesses} + \text{Statistical discrepancy}$$

$$\text{Gross national product} = \text{Net national product} + \text{Depreciation}$$

$$\text{Gross domestic product} = \text{Gross national product} - \text{Net factor payments from abroad}$$

$$\text{Personal income} = \text{National income} - \text{Contribution for social insurance} - \text{Corporate retained earnings} + \text{Non-business interest} + \text{Transfer payments from government and business}$$

$$\text{Disposable income} = \text{Personal income} - \text{Personal income taxes}$$

$$\text{Government savings} = \text{Taxes} - \text{Government spending} - \text{Transfer payments} - \text{Interest on the government debt}$$

$$\text{Private savings} = \text{GDP} + \text{Net factor payments from abroad} + \text{Transfer payments} + \text{Interest on the government debt} - \text{Taxes} - \text{Consumption}$$

$$\text{National savings} = \text{Private savings} + \text{Government savings}$$

$$\text{Direct foreign investment in the U.S.} = - \text{Net exports} - \text{Net factor payments from abroad}$$

$$\text{Investment} = \text{Private Savings} + \text{Government savings} + \text{Direct foreign investment in the U.S.}$$

$$\text{Adult population} = \text{Labor force} + \text{Not in the labor force}$$

$$\text{Labor force} = \text{Working} + \text{Unemployed}$$

$$\text{Unemployment rate} = (\text{Unemployed}/\text{Labor force}) \times 100$$

$$\text{Labor force participation rate} = (\text{Labor force}/\text{Adult population}) \times 100$$

$$\pi = (P/P_{-1} - 1) \times 100$$

$$(Y - Y^*)/Y^* = -2 \times (u - u^*)$$

$$(Y/AP)_n = (Y/AP) \times (1 + G)^n$$

$$\% \Delta Y = \% \Delta A + (2/3) \times \% \Delta N + (1/3) \times \% \Delta K$$

$$Y_d = (1 - t) \times Y$$

$$C = a + b \times Y_d$$

$$I = e - d \times R$$

$$(X - \text{IM}) = (g_x - g_{\text{IM}}) - (n_x + n_{\text{IM}}) \times R - m \times Y_d$$

$$M^S = (k \times Y - h \times R) \times P$$

$$\Delta Y = [1/(1 - b \times (1 - t))] \times \Delta I$$

(the same equation holds for a Δa , ΔG , or $\Delta(X - \text{IM})$ on the right-hand side)

$\Delta Y = [1/(1 - (b - m) \times (1 - t))] \times \Delta I$
 (the same equation holds for a Δa , ΔG , or ΔX on the right-hand side)

$$\pi = \pi^e + f[(Y_{-1} - Y^*)/Y^*]$$

$$C = MPC_{LR} \times Y^d$$

$$\Delta C = MPC_{SR} \times \Delta Y^d$$

$$A_{+1} = A + R \times A + E - T - C$$

$$Y^d = R \times A + E - T$$

$$S = R \times A + E - T - C$$

$$R = r + \pi^e$$

$$R_K = (R + \delta_K) \times P_K$$

$$R_K = (R + \delta_K) \times P_K - (P_{K(+1)} - P_K)$$

$$I_K = K^* - K^*_{-1} + \delta_K \times K^*_{-1}$$

$$K^* = v \times Y$$

$$I_K = v \times (Y - Y_{-1}) + \delta_K \times v \times Y_{-1}$$

$$I_K = s \times (K^* - K_{-1}) + \delta_K \times K_{-1}$$

$$R_K = [(1 - z) \times (R + \delta_K) \times P_K] / [1 - u]$$

$$R_H = (R + \delta_H) \times P_H$$

$$I_H = H^* - H_{-1} + \delta_H \times H_{-1}$$

$$R_{IN} = R \times P_{IN}$$

$$E_R = (E \times P) / P_W$$

$$E_R = q + q_R \times R$$

$$(X - IM) = (g_{EX} - g_{EIM}) - (v_X + v_{IM}) \times E_R - m \times Y_d$$

Actual deficit = Structural deficit + Cyclical deficit

$$D_{+1} = BD + D$$

$$CU = \text{Paper money} + \text{Coins}$$

TR = Bank deposits held at the Fed + Vault cash

$$M^B = CU + TR$$

$$M_1 = CU + ChD + \text{savings accounts}$$

$M_2 = M_1 + \text{small time deposits (CDs)} + \text{money market mutual funds}$

$$TR = rr \times ChD$$

$$CU = c \times ChD$$

$$M^S = [(1 + c)/(rr + c)] \times M^B$$

Total reserves = Borrowed reserves + Nonborrowed reserves

$$OC_M = R - R_M$$

$$M = Y_M / (2 \times z)$$

$$M = ((k \times Y_M) / (2 \times OC_M))^{1/2}$$

$$R = \pi + \beta_\pi \times (\pi - \pi^*) + \beta_Y \times [(Y - Y^*) / Y^*] + r^{e*}$$

$$Y_i = h \times (P_i - P^e) + Y_i^*$$

$$P^e = P^f + b \times (P_i - P^f)$$

$$Y = n \times h \times (1 - b) \times (P - P^f) + Y^*$$

$$W = 1/2 \times (X + X_{-1})$$

$$X = 1/2 \times (W + W_{+1}) - (d/2) \times [(U - U^*) + (U_{+1} - U^*)]$$

$$\pi = \pi^* - [(\beta_Y + \sigma) / \beta_\pi] \times [(Y - Y^*) / Y^*] + [1 / \beta_\pi] \times (r^* - r^{e*})$$

$$\text{Welfare} = [(Y - Y^*) / Y^*]^2 + [\pi - \pi^*]^2$$