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GENERAL PRINCIPLES OF FINANCIAL PLANNING

2 items

Net worth formula

$$\text{Net Worth} = \text{Total Assets} - \text{Total Liabilities}$$

Assets at fair market value; liabilities at outstanding balances.

Savings rate

$$\text{Savings Rate} = \frac{\text{Annual Savings}}{\text{Gross Annual Income}}$$

Typical targets: 10–20% of gross income depending on retirement timeline.

RISK MANAGEMENT AND INSURANCE PLANNING

2 items

Disability income needs

$$\text{Disability Need} = \text{Monthly Expenses} - \text{Other Disability Income}$$

Other income includes Social Security disability, group LTD, spouse income. Replace 60–70% of gross income.

Homeowners coinsurance 80% rule

$$\text{Recovery} = \frac{\text{Insurance Carried}}{0.80 \times \text{Replacement Cost}} \times \text{Loss}$$

If insurance carried $\geq 80\%$ of replacement cost, losses covered in full (up to policy limit).

INVESTMENT PLANNING

15 items

Holding period return (HPR)

$$\text{HPR} = \frac{P_1 - P_0 + D}{P_0}$$

P_0 = beginning price, P_1 = ending price, D = distributions/dividends received.

Real return (approximate)

$$r_{\text{real}} \approx r_{\text{nominal}} - \text{Inflation}$$

Exact: $r_{\text{real}} = \frac{1 + r_{\text{nominal}}}{1 + \text{Inflation}} - 1$

Capital Asset Pricing Model (CAPM)

$$E(r_i) = r_f + \beta_i\big(E(r_m) - r_f\big)$$

r_f = risk-free rate, β_i = systematic risk, $E(r_m) - r_f$ = market risk premium.

Sharpe ratio

$$\text{Sharpe} = \frac{r_p - r_f}{\sigma_p}$$

Excess return per unit of total risk (σ_p). Use to rank undiversified portfolios.

Treynor ratio

$$\text{Treynor} = \frac{r_p - r_f}{\beta_p}$$

Excess return per unit of systematic risk (β). Use to rank well-diversified portfolios.

Information ratio

$$\text{IR} = \frac{r_p - r_b}{\sigma_{p-b}}$$

r_b = benchmark return, σ_{p-b} = tracking error (std dev of active returns).

Portfolio expected return (2-asset)

$$E(r_p) = w_1 E(r_1) + w_2 E(r_2)$$

$w_1 + w_2 = 1$. Weighted average of individual expected returns.

Portfolio standard deviation (2-asset)

$$\sigma_p = \sqrt{w_1^2\sigma_1^2 + w_2^2\sigma_2^2 + 2w_1 w_2 \sigma_1 \sigma_2 \rho_{12}}$$

ρ_{12} = correlation between assets 1 and 2.

Covariance and correlation

$$\text{Cov}(1,2) = \rho_{12}\sigma_1\sigma_2$$

$$\rho_{12} = \frac{\text{Cov}(1,2)}{\sigma_1\sigma_2}$$

Range: $-1 \leq \rho \leq +1$.

Beta formula

$$\beta_i = \frac{\text{Cov}(r_i, r_m)}{\sigma_m^2} = \rho_{im} \cdot \frac{\sigma_i}{\sigma_m}$$

Measures sensitivity of asset return to market return.

R-squared (coefficient of determination)

$$R^2 = \rho_{pm}^2$$

Proportion of portfolio variance explained by the benchmark. Range 0–1; $R^2 = 1$ = perfect correlation.

Current yield (bond)

$$\text{Current Yield} = \frac{\text{Annual Coupon}}{\text{Current Market Price}}$$

Simplified yield; ignores capital gain/loss at maturity.

Approximate yield to maturity (YTM)

$$\text{YTM} \approx \frac{C + \frac{F - P}{n}}{\frac{F + P}{2}}$$

C = annual coupon, F = face value, P = price, n = years to maturity.

Margin requirement and buying power

$$\text{Shares Purchasable} = \frac{\text{Equity}}{\text{Initial Margin} \times P_0}$$

Initial margin: 50% (Reg T). Maintenance margin: typically 25–30%.

Margin call price

$$P_{\text{call}} = \frac{P_0 \times (1 - \text{Initial Margin})}{1 - \text{Maintenance Margin}}$$

Price at which equity falls to maintenance margin level, triggering a margin call.

TAX PLANNING

8 items

After-tax return

$$r_{\text{after-tax}} = r_{\text{pre-tax}} \times (1 - \text{Marginal Tax Rate})$$

Applies to fully taxable instruments. Adjusts nominal yield for investor's marginal bracket.

Tax-equivalent yield (TEY)

$$\text{TEY} = \frac{\text{Tax-Exempt Yield}}{1 - \text{Marginal Tax Rate}}$$

Compares muni bond yield to equivalent taxable yield. Higher MTR → higher TEY advantage.

Taxable income formula (individual, 2026)

$$\text{Taxable Income} = \text{AGI} - \text{Standard Deduction (or Itemized)} - \text{QBI Deduction}$$

2026 standard deductions: Single \$16,100; MFJ \$32,200; HoH \$24,150.

Effective vs. marginal tax rate

$$\text{Effective Rate} = \frac{\text{Total Tax}}{\text{Taxable Income}}$$

Marginal rate = rate on the last dollar of income. Effective rate is always $\leq$ marginal rate.

AMT calculation

$$\text{AMT} = \max(\text{Regular Tax},\ \text{TMT})$$

$$\text{TMT} = 26\% \times \text{AMTI} \leq \$244500 + 28\% \times \text{excess}$$

2026 exemptions: Single \$90,100; MFJ \$140,200 (PO \$500k/\$1M OBBBA).

Child tax credit (2026)

\$2,200 per qualifying child under 17. Full credit for MFJ income $\leq \$400,000$; phases out \$50 per \$1,000 above threshold. Refundable portion: up to 15% of earned income above \$2,500.

SALT deduction cap (2026)

Deduction for state and local taxes capped at \$40,000 (\$20,000 MFS). Phases out above \$500,000 MAGI (OBBBA 2025). Prior law cap was \$10,000.

Kiddie tax threshold (2026)

Net unearned income of a child subject to kiddie tax: amount above $2 \times \$1,400 = \$2,800$ (2× standard deduction for dependents). Taxed at parent's marginal rate.

RETIREMENT SAVINGS AND INCOME PLANNING

12 items

Replacement ratio

$$\text{Replacement Ratio} = \frac{\text{Retirement Income}}{\text{Pre-Retirement Income}}$$

Typical target: 70–80% of pre-retirement gross income.

Retirement capital needs (present value)

$$\text{PV} = \frac{\text{Annual Need}}{r - g} \times \left[1 - \left(\frac{1+g}{1+r}\right)^{n}\right]$$

r = discount rate, g = inflation rate, n = years in retirement. Use TVM: PMT, N, I, FV=0, solve PV.

Required minimum distribution (RMD)

$$\text{RMD} = \frac{\text{Prior Year-End Account Balance}}{\text{Life Expectancy Factor (IRS Uniform Table)}}$$

First RMD by April 1 of year after turning 73. Subsequent RMDs by Dec 31.

2026 401(k)/403(b)/457 contribution limit

Elective deferral limit: \$24,500.

Catch-up age 50+: additional \$8,000 (total \$32,500).

Catch-up age 60–63: additional \$11,250 (SECURE 2.0 super-catchup; total \$35,750).

2026 IRA contribution limit

Traditional and Roth IRA: \$7,500 per person.

Catch-up age 50+: additional \$1,100 (total \$8,600).

Contribution is phased out at higher MAGI for Roth (and for Traditional deductibility when covered by a workplace plan) — check current IRS tables for exact thresholds.

2026 SEP-IRA contribution limit

Lesser of 25% of employee's compensation or \$72,000.

Employer-only contributions; uniform percentage across all eligible employees.

For self-employed, the effective rate is ~18.59% of net self-employment income (accounts for the deduction of half the SE tax and the contribution itself).

2026 SIMPLE IRA contribution limit

Employee elective deferral: \$17,000.

Catch-up age 50+: additional \$4,000 (total \$21,000).

Employer match: dollar-for-dollar up to 3% of compensation, or 2% non-elective.

Section 415 annual additions limit (2026)

Defined contribution plan annual additions limited to lesser of:

100% of participant's compensation, or \$72,000.

Includes employee deferrals + employer contributions + after-tax contributions.

Annuity exclusion ratio

$$\text{Exclusion Ratio} = \frac{\text{Investment in Contract (Cost Basis)}}{\text{Expected Return}}$$

Portion of each payment excluded from income; remainder is ordinary income. Expected return = annual payment × life expectancy.

ADP test (401(k) nondiscrimination)

Actual Deferral Percentage test: HCE average deferral rate $\leq$ NHCE rate + 2%, OR $\leq$ 1.25 × NHCE rate (whichever is less restrictive). Applies to employee elective deferrals in a traditional 401(k).

ACP test (401(k) nondiscrimination)

Actual Contribution Percentage test: same 2-percentage-point / 1.25× rule as ADP, but applied to employer matching contributions and employee after-tax contributions. Run in parallel with ADP for plans that offer a match.

Safe harbor 401(k) exemption

A safe harbor 401(k) plan is exempt from ADP, ACP, and top-heavy testing. Requires either (a) 3% non-elective contribution for all eligible employees, or (b) matching: 100% on first 3% deferred + 50% on next 2% (QACA variants allowed). All safe-harbor contributions must be fully vested immediately.

Gross estate — definition and scope

Gross Estate = probate assets + non-probate assets under IRC §2033–§2044 (includes lifetime transfers with retained interests).

Taxable Estate = Gross - marital - charitable - debts - expenses.

Life insurance in the gross estate (IRC §2042)

Life insurance proceeds are included in the decedent's gross estate if (a) payable to the estate, OR (b) the decedent held any incident of ownership (right to change beneficiary, borrow against policy, assign, surrender, etc.). Transfer of ownership more than 3 years before death removes inclusion.

3-year lookback rule (IRC §2035)

Transfers within 3 yrs of death pulled into gross estate if: (a) release of retained interest (§2036–§2038), or (b) transfer of life insurance on decedent.

Other gifts NOT pulled back — only gift tax paid is added to tentative tax base.

Estate tax calculation

$$\text{Estate Tax} = \text{Tentative Tax on } (\text{Taxable Estate} + \text{Adjusted Taxable Gifts}) - \text{Gift Taxes Paid} - \text{Unified Credit}$$

2026 top rate: 40%. Unified credit offsets tax on exemption amount (\$15M per person, OBBBA permanent).

Gift tax annual exclusion (2026)

\$19,000 per donee per year (indexed for inflation). Married couple gift-splitting: \$38,000 per donee.

Exclusion available for present interest gifts only; future interest gifts (e.g., most trusts) do not qualify.

Unified credit / lifetime exemption (2026)

Lifetime estate and gift tax exemption: \$15,000,000 per person (OBBBA 2025, permanent).

Spouses may port unused exemption (portability election on Form 706 within 9 months of death, extended to 5 years).

Generation-skipping transfer tax (GSTT)

Flat tax of 40% on transfers to skip persons (2+ generations below transferor, or unrelated persons ≥ 37.5 years younger).

GSTT exemption: \$15,000,000 per transferor (same as estate/gift exemption, 2026).