Week 1 Study Guide: Bonds Overview & Interest Rates

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1. Key Concepts

- **Bond features:** Every bond is characterized by its **issuer** (Treasury, corporate, municipal, foreign sovereign, agency), **term/maturity** (short-term <1yr vs. long-term >1yr vs. perpetual), **coupon** (fixed, floating, zero-coupon, inflation-indexed), **price relative to par** (par, discount, premium), **credit risk** (risk-free vs. defaultable, seniority, covenants), and **currency**/trading venue (Yankee, Eurobond, Samurai).
- **Bond risks:** Interest rate risk, credit/default risk, inflation risk, liquidity risk, reinvestment risk, call/prepayment risk, and currency risk.
- **Three measures of bond returns:**
  - **Coupon rate** (r_c): contractual — does not depend on price.
  - **Promised return / yield** (y): return if all *promised* payments are made. This is just another way of quoting prices — an attempt to make price comparisons across bonds interpretable.
  - **Expected return** (r_{exp}): return discounting *expected* cash flows, accounting for default. Pricing bonds works just like pricing any other asset: you need cash flows and a discount rate. The discount rate needed to price bonds is the expected return.

  For risky bonds: $y > r_{\text{exp}} > r_f$. The gap between y and r_{exp} reflects expected loss from default.
- **Prices and yields are inversely related.** Headlines saying "yields are up because prices are down" are tautological. The real question: *why did the discount rate change?* (monetary policy, term premium, credit risk, inflation expectations.)
- **Yield curve:** Government yields plotted against maturity. Normal (upward-sloping) reflects term premia. Inverted curves historically predict recessions.
- **Expectations hypothesis & term premia:** Long rates = average expected future short rates + term premium. Forward rates are *not* unbiased forecasts of future spot rates because investors demand compensation for inflation risk and real interest rate risk.
- **The Fed's dual mandate:** Maximum employment and stable prices (2% PCE inflation target with average inflation targeting). The **FOMC** sets the target Fed Funds rate.
- **Reference rates: Fed Funds rate** — overnight uncollateralized interbank rate. **LIBOR** — phased out after manipulation scandal. **SOFR** — replacement benchmark based on actual Treasury repo transactions.

2. Key Formulas, Intuition, and Examples

Promised return (yield): The single discount rate equating price to PV of all *promised* cash flows.

$$P = \frac{C}{1+y} + \frac{C}{(1+y)^2} + \cdots + \frac{C+FV}{(1+y)^n}$$

Expected return (CAPM): Reflects the bond's systematic risk.

$$r_{\text{exp}} = r_f + \beta(E[r_m] - r_f)$$

Pricing a risky bond: Discount *expected* cash flows at the expected return.

$$P = \frac{p \times (\text{Coupon} + \text{Face}) + (1-p) \times \text{Recovery}}{1 + r_{\text{exp}}}$$

Golden Sachs example: $r_f = 5\%$, $\beta = 0.33$, market risk premium = 7.6%, coupon = 10% on \$1000 face, default probability = 20%, recovery = principal only (\$1000).

1. Expected return: $r_{\text{exp}} = 5\% + 0.33 \times 7.6\% = 7.5\%$
2. Price: $P = \frac{0.80 \times 1100 + 0.20 \times 1000}{1.075} = \frac{1080}{1.075} \approx \$1005$
3. Promised yield: $1005 = \frac{1100}{1+y} \implies y \approx 9.5\%$
4. Summary: $r_c = 10\% > y = 9.5\% > r_{\text{exp}} = 7.5\% > r_f = 5\%$

Taylor Rule (descriptive model of how the Fed sets rates):

$$i = r^* + \pi + 0.5(\pi - \pi^*) + 0.5(y - y^*)$$

r^* = real equilibrium rate (∼2%), π = current inflation, $\pi^* = 2\%$, $(y - y^*)$ = output gap.
Spring 2026: $i = 2 + 2.4 + 0.5(0.4) + 0.5(0) = 4.6\%$. Actual Fed Funds: 3.50–3.75% ⇒ Fed may be slightly accommodative.
Quantity Theory of Money: $MV = PQ$. Doubling M doubles P in the long run (velocity and real output held constant). Short-run caveat: changes in V impede transmission.
Fiscal Theory of the Price Level: Real value of government debt = PV of future real primary surpluses.

$$\frac{\text{Nominal Debt}_t}{\text{Price Level}_t} = E_t \sum_{j=0}^{\infty} \frac{\text{Real Primary Surplus}_{t+j}}{\text{Discount Rate}_{t,t+j}}$$

A higher discount rate makes surpluses worth less → price level rises. The US benefits from low discount rates due to the "special status" of Treasuries.

3. Key Facts (Spring 2026)

- Fed Funds rate: 3.50–3.75% (down from 5.25–5.50% peak). FOMC dot plot: median projects one more cut this year (to ∼3.4%).
- 10-Year Treasury: 4.25%; 30-Year: 4.85%. Long rates stayed high despite 175bp of Fed cuts.
- Yield curve is upward sloping again after an extended inversion.
- CPI: 2.4% YoY; Core CPI: 2.5% — above the Fed's 2% target.
- Credit spreads: IG ∼90bp, BBB ∼130bp, HY ∼330bp — tight by historical standards (HY peaked at ∼2000bp in 2008).
- 30-year fixed mortgage rate: ∼6.7%. Private credit (BDC/direct lending): 9–11%.
- Foreign 10-year sovereign yields: German Bund ∼2.7%, Japan JGB ∼1.5%, UK Gilt ∼4.7%.
- Long rates remain elevated due to: fiscal deficits increasing Treasury supply, inflation expectations above 2%, rising term premium, and geopolitical uncertainty.