



Fixed Income

STG FW24 Week 4



Agenda

- Market Update
- Open Discussion
- Fixed Income
- Q&A



Market Update(Last Week from 9/19-9/26)

- **S&P 500:** 5,722 **+5.0**
- **NASDAQ:** 18,082 **+56**
- **Dow Jones:** 41,914 **-100**
- **Crude Oil:** \$71.77 **+0.77**
- **Gold:** \$2,595 **-16**
- **10-Year Yield:** 3.72% **-0.01%**
- **Bitcoin (BTC):** \$63,478 **+3**



Market Update(10/3)

- **S&P 500:** 5,699.94 **-22.06**
 - **NASDAQ:** 17,918.48 **-163.52**
 - **Dow Jones:** 42,011 **+597.59**
 - **Crude Oil:** \$73.86 **+2.09**
 - **Gold:** \$2,668.31 **+73.4**
 - **10-Year Yield:** 3.853% **+0.126%**
 - **Bitcoin (BTC):** \$60,938 **-2539.14**
- In the week ending September 28th, the number of Americans filing unemployment benefits increased above market estimates by 6,000 from the previous week to 225,000.
 - Total Energies(TTE:NYSE) a large-scale chemicals manufacture and petroleum company, executes \$8 billion in share buybacks.

Open Discussion

- Recent Trades?
- News?
- Predictions?
- Economic Data?
- Earnings?
- Etc.





Fixed Income

Fixed income refers to a type of investment security that pays investors fixed interest or dividend payments until its maturity date.

After maturity, the principal amount invested is returned to the investor.

The most common types of fixed income securities are bonds, which can be issued by governments, municipalities, or corporations.



FI Securities Characteristics

- Regular income
- Principal repayment (Par value)
- Risk
- Interest Rate Influence
- Credit Rating



FI Summary

Fixed income investments are a key component of a diversified investment portfolio, offering a balance between risk and return while providing regular income.

They are particularly favored by investors who are risk-averse or require a steady income stream.



Bond Valuation (BV)

Bond valuation is the process of determining the fair value of a bond.

This valuation is crucial for both investors and issuers to understand the worth of a bond in the current market environment. Here are the key components and steps involved in bond valuation



Present Value of Future Cash Flows (BV)

Bond valuation typically involves calculating the present value of the bond's future interest payments (coupons) and the present value of its principal repayment at maturity.

The sum of these two present values gives the bond's fair value.



Interest Rates and Yields (BV)

Interest Rates and Yields: The discount rate used in bond valuation is typically the bond's yield to maturity (YTM), which is the interest rate that equates the present value of the bond's future cash flows to its current price.

Changes in interest rates in the broader market affect the YTM and, consequently, bond prices.



Terminology

Coupon Payment

The coupon rate of the bond, which is set at issuance, determines the periodic interest payments the bond will make. These payments are a key component of the bond's future cash flows.

Maturity

The time until the bond's principal is repaid impacts its valuation. Longer-term bonds are generally more sensitive to interest rate changes than shorter-term bonds.



Terminology

Credit

The issuer's creditworthiness affects the bond's risk and, therefore, its yield and valuation. Bonds issued by entities with higher credit risk typically offer higher yields to compensate investors for the increased risk.

Market Conditions

The bond's price can fluctuate based on overall market conditions, including changes in interest rates, inflation expectations, and the economic outlook.



Term Structure of Interest Rates

Yield Curve

- Greater the maturity, most likely greater yield

Spot Rates vs Forward Rates

- Spot rates \rightarrow Yields on zero coupon bonds or different maturities
- Forward Rates \rightarrow future interest rates implied/predicted by current market



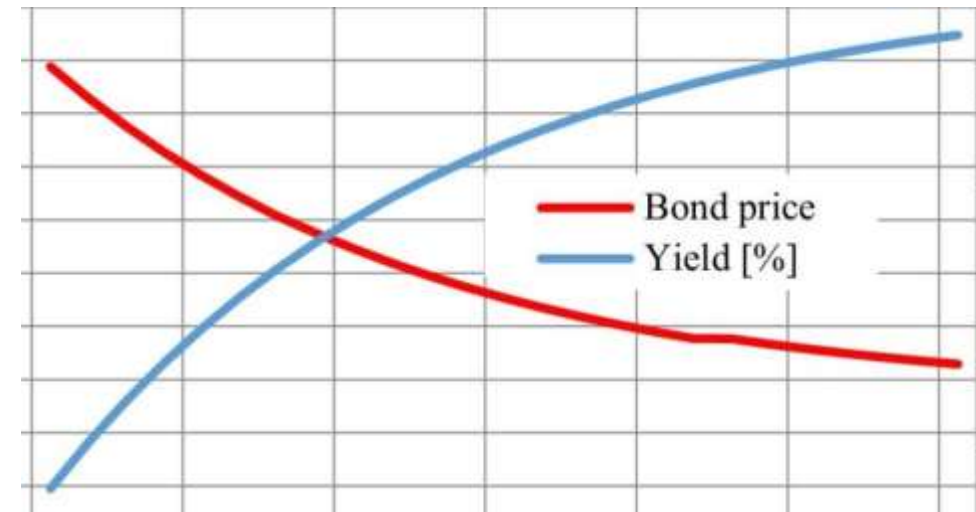
Bond Pricing & Interest Rate Risk

- Price based on present value of future cash flow
 - Use yield to maturity (YTM) as discount rate
- YTM is annualized rate of return if investor holds till maturity
- Bond price is inversely related to YTM
- Duration
 - Longer duration are more sensitive to interest rates
- Convexity
 - Degree to which bond prices change in response to change in interest rates
 - Higher convexity = more volatility when interest rates change



Inverse Relationship of Price and YTM

- When interest rates rise, new bonds offer higher coupon rates
- Old bonds with low coupon rates become less desirable, causing price to fall to make up for the lower yield
- When interest rates fall, new bonds offer lower coupon rates
- Old bonds with higher coupon rates become more desirable, causing price to rise to make up for the higher yield



5% yield on a \$100 bond = \$5

Which is the equivalent to

10% yield on a \$50 bond = \$5



Bond Pricing Problem

A 1 Year Bond sells for \$300 and has a yield of 4%. What would the price be if the yield falls to 3%?

$$\text{New Price} = \text{Old Price} * (\text{Old Yield} / \text{New Yield})$$

$$\text{New Price} = \$300 * (0.04 / 0.03)$$

$$\text{New Price} = \$300 * 1.333333$$

$$\text{New Price} = \$400$$

****This example is very specific to a 1 Year Bond, and ignores Face Value****



Bond Pricing Formula

$$P = \sum_{t=1}^n \frac{C}{(1+r)^t} + \frac{F}{(1+r)^n}$$

P = Bond Price

C = Coupon Payment Per Period

r = YTM Per Period (decimal)

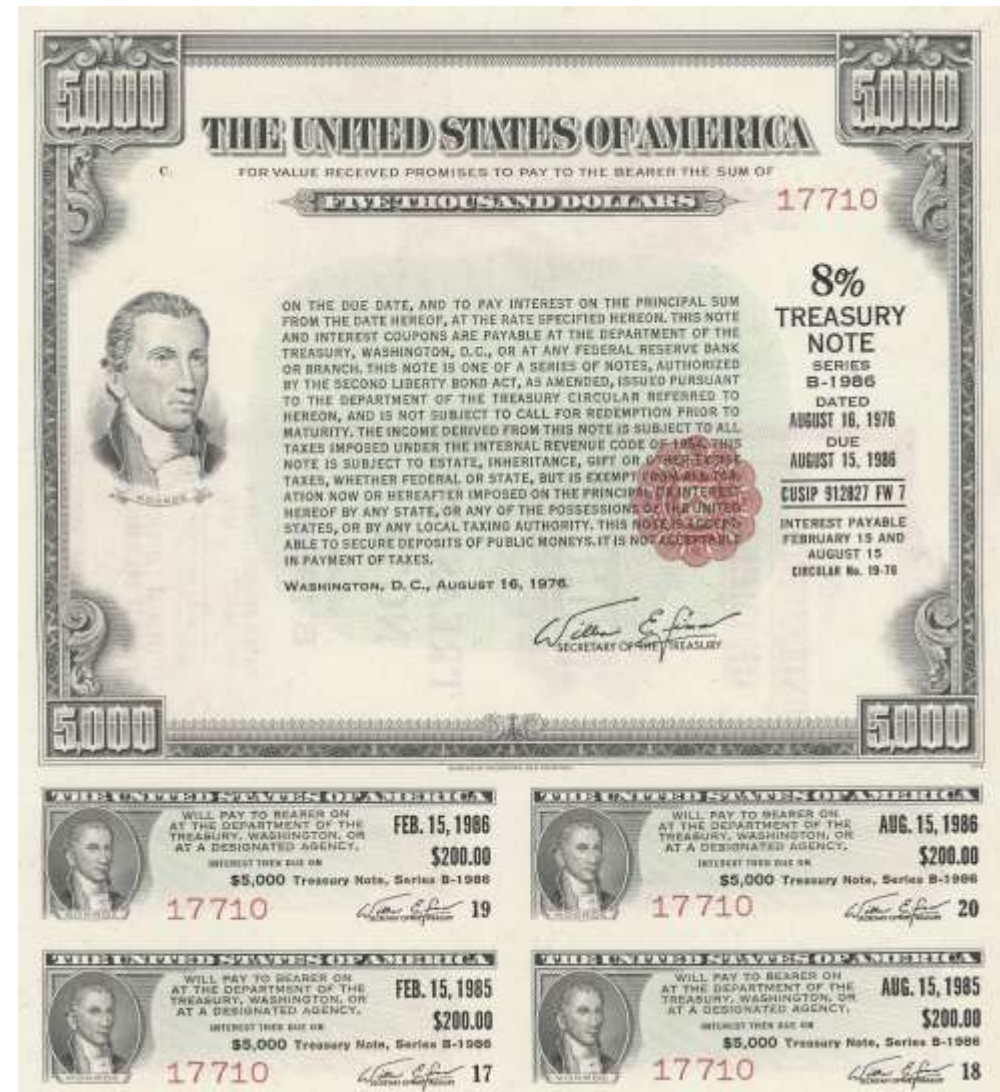
F = Face Value

n = Total Periods Until Maturity

t = Current Period (1 to n)

Government Bonds

- Yield spreads
- Treasury bills
- Agency backed securities





Corporate Bonds

- Raise capital by issuing debt
- Investment Grade (**BBB-**/Baa3) vs High Yield (distressed debt)
- Secured bonds are backed by assets or collateral
- Unsecured bonds not backed by collateral
- Convertible Bonds allow holder to convert to common stock

Credit Risk & Credit Analysis

- Defaults
- Issuer risk (credit worthiness)
- Macroeconomic factors
- Credit rating & credit agencies
- Credit spreads
 - Investors demand is the spread between corporate bond and risk free gov bonds (T-Bills)





Fixed Income Derivatives

- Interest rate securities' futures (10yr Yield)
- Interest rate swaps
- Options on interest rate securities (caps & floors) (low liquidity)
- Credit default swaps
- Asset backed security derivatives

Credit Default Swaps



Credit Default Swaps (CDS)



- Buyer of CDS pays small premium (quarterly or annually) to ensures the position incase of default
- Seller of CDS collects premium but grantees to compensate buyer incase of default.
- CDS prices are influenced by the market's perception of credit risk.



Asset-Backed Securities

- Financial instrument collateralized by an underlying pool of assets to generate cash flow from debt.
- Loans, leases, credit balances, receivables.
- Producer higher YTM than government or corporate bonds
- Special Purpose Vehicle (SPV) pools the assets payments, constructs ABS securities, and distributes to investors.

Mortgage-Backed Securities

- Cash flow from mortgage loans complied into a MBS
- RMBS & CMBS
- Credit risk, including risk of default by mortgage borrowers and the risk of losses on underlying collateral
- Mortgage lenders (banks) issue loans, pooled & issued by banks.
- Agency MBS & non-Agency MBS





Treasury Inflated Protected Securities

- Treasury bond designed to provide protection against inflation
- Backed by U.S. Department of the Treasury (safe/high liquidity)
- Principal value adjusts based on changes to CPI
- Fixed Rate (semi annually)
- Deflation hurts principal but will not decrease below par value at maturity



Fixed Income Portfolio Weight

- There are many ideologies and models regarding what percent of your portfolio should be composed of fixed income
- Different investors should base their weighting on factors such as risk tolerance, age, income, etc.
- One example for risk adverse investors is represented by the following

$$B\% = 0, \text{ if } A < 30$$

$$B\% = A, \text{ if } A > 30$$

The Proper Asset Allocation Of Stocks & Bonds By Age

Conventional Model

| Age | Stocks | Bonds |
|--------|--------|-------|
| 0 - 25 | 100% | 0% |
| 30 | 70% | 30% |
| 35 | 65% | 35% |
| 40 | 60% | 40% |
| 45 | 55% | 45% |
| 50 | 50% | 50% |
| 55 | 45% | 55% |
| 60 | 40% | 60% |
| 65 | 35% | 65% |
| 70 | 30% | 70% |
| 75+ | 25% | 75% |



Q & A



Thank you for coming

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