

# Overview of Fixed-Income Portfolio Management

## 1. INTRODUCTION

Fixed income markets incorporate:

- i. Publicly traded securities (such as commercial papers, notes, bonds)
- ii. Non-publicly traded securities (such as loans and privately placed securities)

## 2. ROLES OF FIXED INCOME SECURITIES IN PORTFOLIOS

### 2.1 Diversification Benefits

Fixed income when combined with other asset classes

- provide diversification benefits.
- may significantly lower portfolio risk

Note: Correlations among asset classes or volatility of asset class returns may  $\Delta$  overtime or due to  $\Delta$  in capital market dynamics.

### 2.2 Benefits of regular Cash Flows

Fixed-income investments often provide regular cash-flow streams that can be sued to fund the projected future liabilities by matching the timing and amount of those liabilities.

### 2.3 Inflation Hedging Potential

Inflation-linked bonds:

- provide inflation-hedging benefits.
- are suitable for investors with long-investment horizon
- can result in superior risk-adjusted real portfolio returns
- Their return has two components: Real return plus additional return (directly linked to inflation rate).
- Their return volatility is relatively lower than conventional bonds & equities.

**Various Bonds and Inflation Protection**

	Fixed-coupon bonds	Floating-coupon bonds	Inflation-linked bonds
Coupon	Inflation unprotected	Inflation protected	Inflation protected
Principal		Inflation unprotected	

### 3. FIXED-INCOME MANDATES

Two broad classifications of fixed income mandates are:

- 1) **Liability-based mandates:** These include:
  - i) Cash flow matching
  - ii) Duration matching
  - iii) Derivatives overlay
  - iv) Contingent immunization
- 2) **Total return mandates:** These include:
  - i) Pure indexing
  - ii) Enhanced indexing
  - iii) Active management

#### 3.1 Liability-Based Mandates

Three immunization approaches are:

1. **Cash Flow Matching:** it matches precisely all future liability streams by cash flows from fixed income investments
2. **Duration matching:** it matches duration of assets and liabilities in a way that when interest rates  $\uparrow$  or  $\downarrow$ ,  $\Delta$  in bond portfolio's MV closely match  $\Delta$  in the liability portfolio.
3. **Contingent Immunization:** A hybrid approach that combines immunization with active management approach when there is a surplus available i.e., when portfolio value  $>$  PV of liabilities.

#### 3.2 Total Return Mandates

Three immunization approaches are:

1. **Pure Indexing:** Full replication is done by owning all the bonds in the index in the same % as the index.  
  
Both active return and active risk are zero.
2. **Enhanced Indexing:** The objective is to outperform the index by small risk factor mismatches
3. **Active Management:** The objective is to outperform the benchmark by opting for *large risk factor* mismatches on duration, sector weights and other factors

#### 3.3 Fixed-Income Mandates with ESG Considerations

Analysts should conduct ESG analysis to check the portfolio holdings with respect to ESG related provisions.

**4. FIXED INCOME PORTFOLIO MEASURES**

Some bond risk and return measures are as follows:

- I. **Macaulay Duration (MacDur)** is weighted average of time until the bond's cash flows are received.
- II. **Modified Duration (ModDur)** measure the relation between %  $\Delta$  in bond's price for a %  $\Delta$  in yield.
- III. **Effective Duration (EffDur)** is bond's price sensitivity to  $\Delta$  in benchmark yield curve.
- IV. **Key Rate Duration (KeyRatDur)** measures bond's sensitivity to  $\Delta$  in the shape of the yield curve
- V. **Empirical duration** measures bond's interest rate sensitivity that is determined from market data.
- VI. **Money Duration (a.k.a. dollar duration)** measures the bond's absolute price  $\Delta$  in currency units  $i$
- VII. **Price Value of a basis point (PVBP)** estimates  $\Delta$  in bond's price for a 1 bp  $\Delta$  in yield
- VIII. **Convexity**, a second-order effect, captures bond price behavior for larger movements in yield curve.
- IX. **Effective Convexity (EffCon)** measures the secondary effect of a  $\Delta$  in a benchmark yield curve on bond prices.

**4.1 Portfolio Measures of Risk and Return**

**Bond Portfolio Duration** - sensitivity of a portfolio of bonds to small changes in interest rates.

**Modified duration of a bond portfolio** – measures % change in the market value given a change in yield to maturity (YTM).

**Convexity of a bond portfolio** - A second order effect that can be applied for large yield curve changes.

**Spread duration** - measures a portfolio's sensitivity as a result of widening or narrowing of the credit spread.

**Duration time spread (DTS)** – a modification of spread duration that incorporates the empirical observation to determine spread changes across the credit spectrum by using proportional % basis point changes instead of absolute basis point changes.

**Portfolio Dispersion** measures the variance of the time to receive cashflows i.e., the extent to which payments are spread out around the duration.

**4.2 Correlation between Fixed-Income Sectors**

- Correlations between fixed-income sectors will be lower across markets/economies than within a market.
- Global government bonds are affected by  $\Delta$  in interest rates and currency exchange rates.

**4.3 Use of Measures of Risk and Return in Portfolio Management**

**4.3.1 Portfolio Duration in Total Return Mandates**

Portfolios are usually exposed to macroeconomic risk factors.

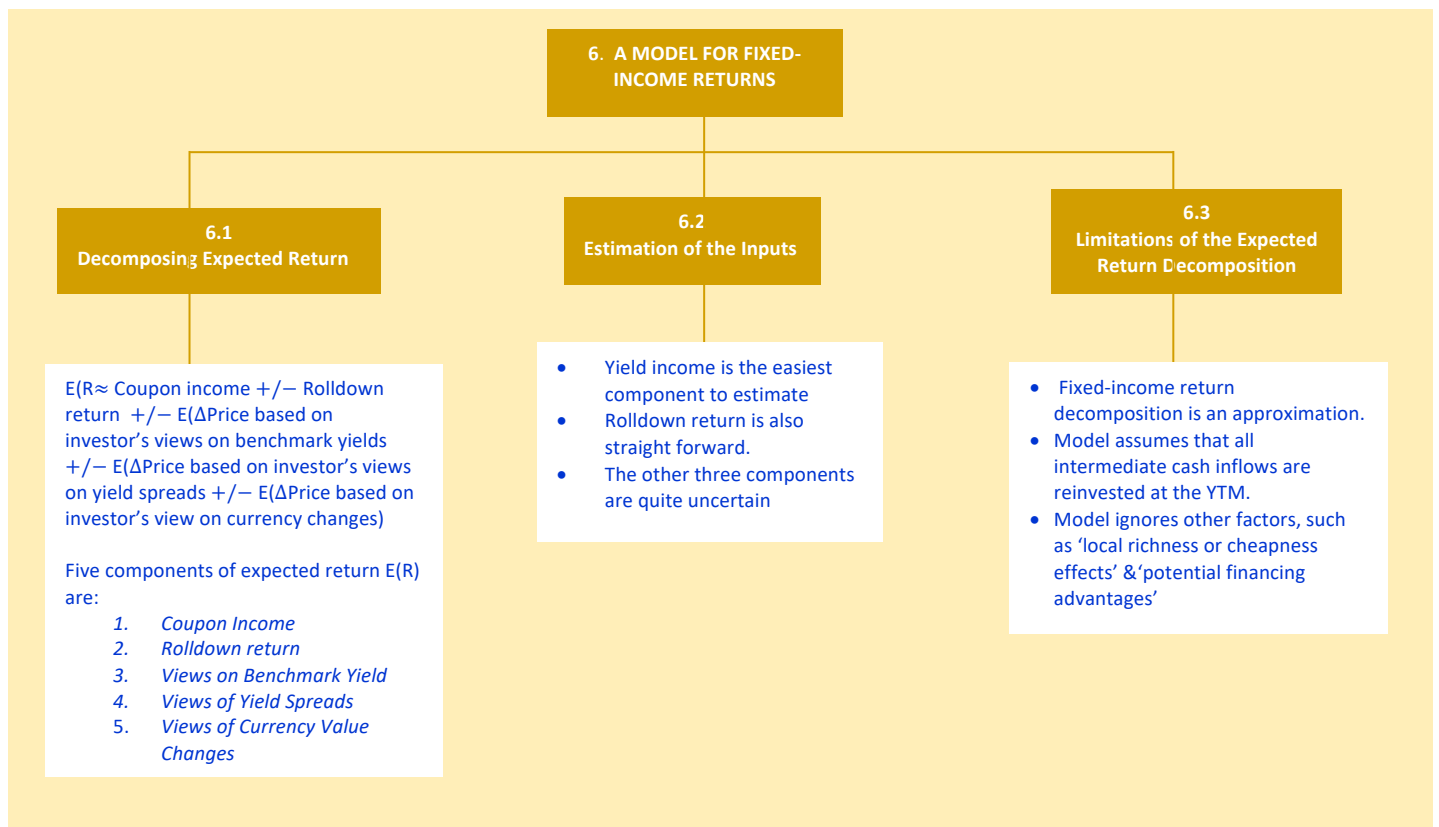
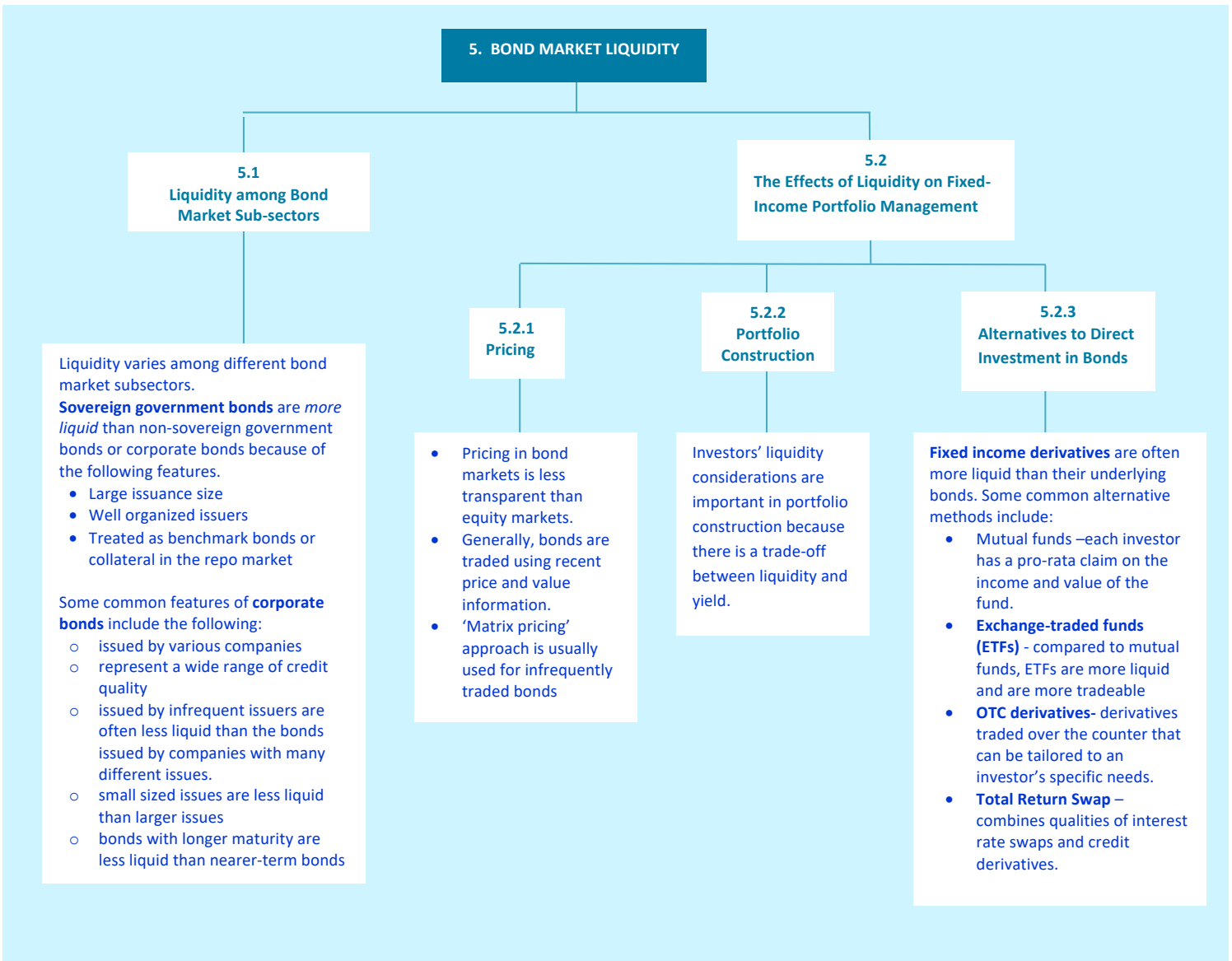
**4.3.2 Managing Credit Exposure Using Spread Duration**

Portfolio managers may:

- $\uparrow$  ( $\downarrow$ ) the **portfolio's spread duration** when credit spreads are expected to narrow (widen).
- $\uparrow$  ( $\downarrow$ ) the **portfolio's credit exposure** by  $\downarrow$  ( $\uparrow$ ) the portfolio's average credit rating.

**4.3.3 Relative Value Concept**

Managers usually compare, and rank securities within a given time horizon based on considerations such as valuation, issuer fundamentals, market conditions



7. LEVERAGE

7.1 Using Leverage

Leverage Portfolio Return  $r_P$   

$$= \frac{\text{Portfolio Return}}{\text{Portfolio Equity}}$$

$$= \frac{[r_I \times (V_E + V_B) - (V_B \times r_B)]}{V_E}$$

To recognize the significance of leverage on returns, the above equation can be decomposed into two portions:  

$$r_P = r_I + \frac{V_B}{V_E}(r_I - r_B)$$

If  $r_I > r_B$  leverage  $\uparrow$  the portfolio return  
 If  $r_I < r_B$  leverage  $\downarrow$  the portfolio return

7.2 Methods for Leveraging Fixed-Income Portfolios

7.3 Risks of

Leverage can significantly  $\uparrow$  the magnitude of losses even for moderate valuation declines.

7.2.1 Future Contracts

- Futures contracts are important source of leverage
- $\text{Leverage}_{\text{Futures}} = \frac{\text{Notional Value} - \text{Margin}}{\text{Margin}}$

7.2.2 Swap Agreements

- Interest rate swaps are equivalent to long-short bond portfolio.
- **fixed-rate payer** effectively short a fixed-rate bond and long a floating rate bond and the value of the swap for the fixed rate payer  $\uparrow$  when interest rates  $\uparrow$ .
- **fixed-rate receiver** effectively long a fixed rate bond and short a floating-rate bond and the value of the swap for the fixed-rate receiver  $\uparrow$  when interest rates  $\downarrow$ .

7.2.3 Structured Financial Instruments

- Structured financial instruments are constructed to redistribute risk.
- Inverse floater is a type of structured financial instrument whose coupon rate has an inverse relationship to the market interest rate e.g. Coupon rate = 15% - (1.5 x Libor<sub>3-month</sub>)

7.2.4 Repurchase Agreements

- an important source of short-term financing.
- Repos are kind of collateralized loans.
- In a repurchased agreement, security owner (borrower) sell a security for cash and agrees to repurchase it from the lender at a specific future date and an agreed on price
- Repo agreements may be **cash driven** or **security driven**.
- On the basis of settlement, repos can be categorized as **bilateral** repos or **tri-party** repos.

7.2.5 Security Lending

- Two motives of security lending are i) to facilitate short selling & ii) for collateralized borrowing or financing.
- In a short selling, short seller borrows the security from someone else and then sells the security and receives immediate payment. The short seller later returns the security.
- In financing-motivated loan, a bond owner lends securities to investor and receives cash.
- Unlike repos, security lending transactions are open-ended

**8. FIXED INCOME PORTFOLIO TAXATION**

**7.1 Principles of Fixed-Income Taxation**

**7.2 Investment Vehicles and Taxes**

Some common tax principles of fixed-income investments are:

- Compared to interest income, capital gains/losses are taxed at ↓ rates.
- Zero-coupon bonds investors are required to pay tax on imputed interest income (i.e. amortization of discount in some countries).
- Capital losses can be used to reduce capital gains and can be carried forward or in some jurisdictions can be carried back.
- In some countries short-term capital gains are taxed at ↑ rate than long-term capital gains.

Some tactics to manage fixed-income portfolios for tax purposes include the following:

- Prudently cancel out capital gains and losses.
- Carefully realize short-term gains if short-term capital gain tax rate > long-term capital gain tax rate.
- Realized losses can be used to offset current or future capital gains.
- Extend holding periods to defer taxes.
- Take into account the trade-off between capital gains and income.

Different investment vehicles are taxed differently based on type of assets involved and jurisdiction.