BACHELOR of ECONOMICS
International Program
Thammasat University | Thailand

Fixed Income (FM 645)

Bond portfolio management

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Road map/Key ideas

- The investment management process
- Active portfolio management

  - Interest rate expectation strategies

  - Yield curve strategies
- Indexing

The investment management process

1. Setting investment objectives
2. Establishing an investment policy
3. Selecting a portfolio strategy
   a) Passive strategies
      - Indexing
      - Interest rate risk management
   b) Active strategies
   c) Mixed active and passive strategies
      - Active or passive? Depends on:
        – The client or manager's view of the pricing efficiency of the market
        – The nature of the liabilities to be satisfied.

The investment management process

4. Selecting assets: evaluation of individual securities.
   - Evaluate total return given investment horizon
   - Evaluate the sensitivity to factors that influence returns
5. Measuring and evaluating performance.

Active strategies for Treasury securities

- Interest rate expectation strategies
- Yield curve strategies

Interest rate expectation strategies

- Manager believes he/she can accurately forecast future interest rate levels
- Process:
  - Evaluate what the market consensus is
  - Compare the manager's forecast with the market consensus
  - Alter the sensitivity of bond portfolio to capitalize on interest rate changes accordingly

Concept Check

You manage a bond fund. Your bond portfolio has a modified duration of 9. The yield curve is close to flat at approximately 4%. Your view with respect to the market consensus is that interest rates, overall, are going to decrease further. Which of these trades will capitalize most on your view?

G) Buy a 15 year zero and sell a 3-year 8% coupon bond currently in the portfolio

Y) Buy a bond with modified duration of 9

R) Buy a 3 year zero and sell a 10 year 3% coupon bond currently in the portfolio

Interest rate expectation strategies

- Managers believes: (compared to consensus)
  - Future rate decrease →
  - Future rate increase →

Interest rate expectation strategies

- Managers believes: (compared to consensus)
  - Future rate decrease → increase sensitivity (duration)
  - Future rate increase → decrease sensitivity (negative duration)
- Ways of altering duration
  - Rate anticipation swap
    - Increase duration: buy long duration sell low duration
    - Decrease duration: sell long duration buy low duration
  - Use interest rate derivatives

Concept Check

Your current portfolio ABC includes the following securities:

	Market value	Modified duration of the bond
Long bond A	5M	4
Long bond B	3M	6
Short bond C	4M	3.5

What is the duration of your portfolio?

G) 2.5

Y) 3

R) 6

Concept Check

You believe interest rates are going to decrease further by 50 bps. You want to have a portfolio that capitalize on this view, and you want the value of your portfolio to increase by 2% if your view is correct. What should be the modified duration (in years) of your portfolio?

G) 3

Y) 4

R) 8

Concept Check

You happen to find a 10-year bond that you think is underpriced and a 6-year bond that you think is overpriced. You would like to change the position of the original ABC portfolio to 4. Which of the bonds would you buy/sell? How much (market value) do you have to buy/sell? (the last question is for you to do at home, using YTM=4%).

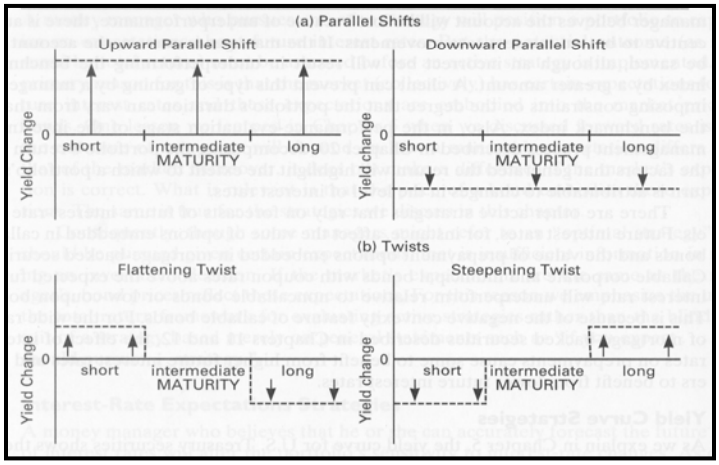
G) Buy the 10-year bond

Y) Sell short the 6-year bond

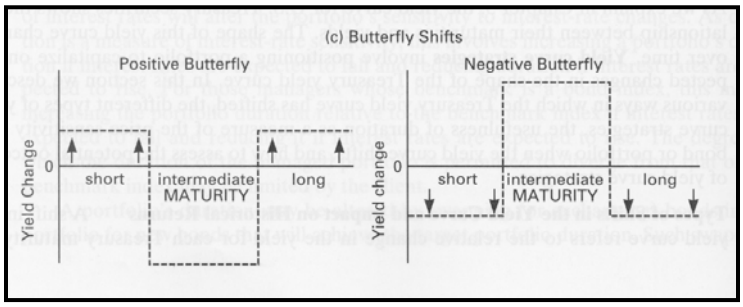
R) Buy the 6-year bond

Yield curve strategies

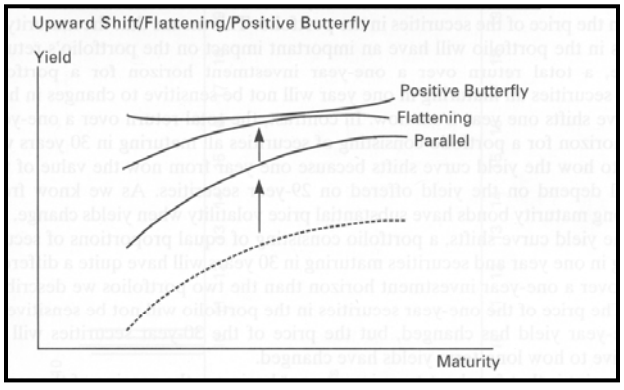
Type of shifts in the yield curve: historical



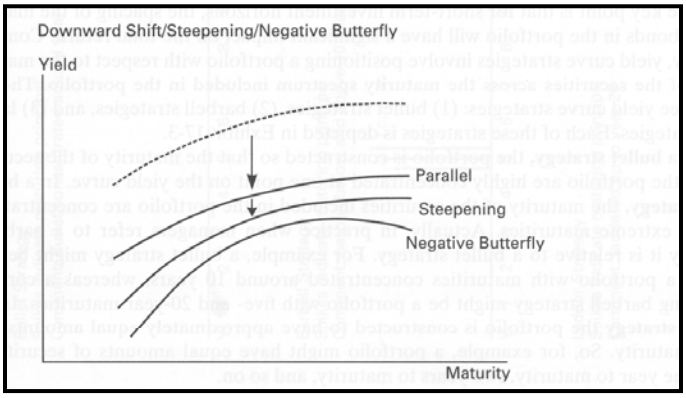
Yield curve strategies



Yield curve strategies



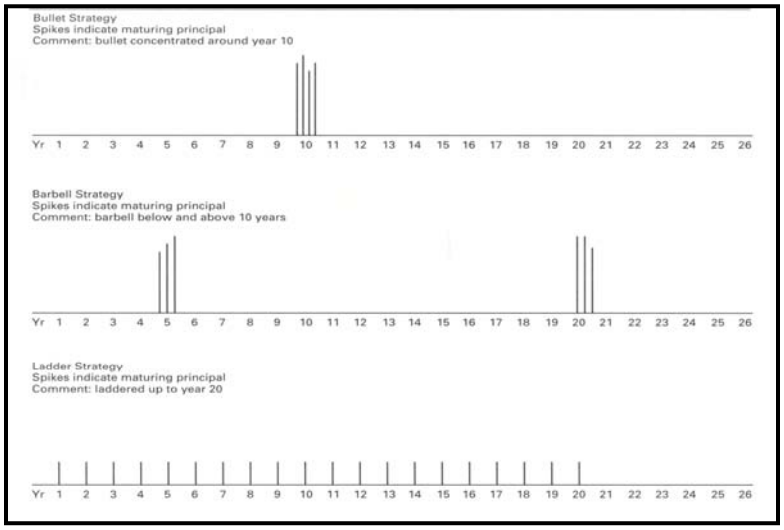
Yield curve strategies



Yield curve strategies

- Yield curve shifts : historical 1979-1990
  - Parallel shifts and twists account for 91.6% of Treasury returns
  - Butterfly shifts account for 3.4% of Treasury returns
  - Unexplained factors account for 5%
  - Different yield curve shifts are related
  - - Down shift → steepen
  - - Upward shift → flatten

Yield curve strategies



Yield curve strategies

- If the cash flows of the trading strategies are very unevenly concentrated, using duration alone in determining the relative performance of two portfolios may be misleading
- Duration of Bullet portfolio=duration of Barbell portfolio = 6.434 (duration compute using one YTM)
- Performance = bullet's portfolio total return – barbell portfolio total return

Yield curve strategies: example

EXHIBIT 17-5 Relative Performance of Bullet Portfolio and Barbell Portfolio over a Six-Month Investment Horizon[a]

Yield Change	Parallel Shift	Nonparallel Shift[b]	Nonparallel Shift[c] (%)
−5.000	−7.19	−10.69	−3.89
−4.750	−6.28	−9.61	−3.12
−4.500	−5.44	−8.62	−2.44
−4.250	−4.68	−7.71	−1.82
−4.000	−4.00	−6.88	−1.27
−3.750	−3.38	−6.13	−0.78
−3.500	−2.82	−5.44	−0.35
−3.250	−2.32	−4.82	0.03
−3.000	−1.88	−4.26	0.36
−2.750	−1.49	−3.75	0.65
−2.500	−1.15	−3.30	0.89
−2.250	−0.85	−2.90	1.09
−2.000	−0.59	−2.55	1.25
−1.750	−0.38	−2.24	1.37
−1.500	−0.20	−1.97	1.47
−1.250	−0.05	−1.74	1.53
−1.000	0.06	−1.54	1.57
−0.750	0.15	−1.38	1.58
−0.500	0.21	−1.24	1.57
−0.250	0.24	−1.14	1.53
0.000	0.25	−1.06	1.48
0.250	0.24	−1.01	1.41
0.500	0.21	−0.98	1.32
0.750	0.16	−0.97	1.21
1.000	0.09	−0.98	1.09
1.250	0.01	−1.00	0.96
1.500	−0.08	−1.05	0.81
1.750	−0.19	−1.10	0.66
2.000	−0.31	−1.18	0.49
2.250	−0.44	−1.26	0.32
2.500	−0.58	−1.36	0.14
2.750	−0.73	−1.46	−0.05
3.000	−0.88	−1.58	−0.24
3.250	−1.05	−1.70	−0.44
3.500	−1.21	−1.84	−0.64
3.750	−1.39	−1.98	−0.85
4.000	−1.57	−2.12	−1.06
4.250	−1.75	−2.27	−1.27
4.500	−1.93	−2.43	−1.48
4.750	−2.12	−2.58	−1.70
5.000	−2.31	−2.75	−1.92

Yield curve strategies

- For an accurate analysis of yield curve strategies use horizon analysis
- Horizon analysis is a comparison of each portfolio's return over the investment horizon given the TIR predictions
- Compared to using duration, horizon analysis is more accurate but also more complicated
- Horizon analysis can be used to compare after tax returns

Yield curve strategies

- Choose holding period horizon
- Compute HPR for each portfolio strategy
- HPR = (end price-begin price+coupon+interest coupon reinvestment)/begin price
- To compute HPR, a manager needs
  - Current yield curve
  - Expectation about the yield curve at the end of the investment horizon to compute end prices
  - Expectations about the interest rates prevailing during the investment horizon to compute interest from coupon reinvestments

Indexing

- Bond indexing is a passive management strategies where managers take bond prices as fairly set
- The objective of bond market indexing is to create a portfolio that mirrors the composition of an index that measures the broad market
- Example of broad market index
  - Salomon Smith Barney Broad Investment Grade index
  - Lehman Brothers Aggregate bond index
  - Merrill Lynch Domestic Master index

Indexing

Duration/ Sector	Treasury	Corporate	Mortgage	Utility	Yankee (Intl)
1 year					
2 years					
3-5 years					
5-10 years					
10-20 years					
30 years					

Summary

- The investment management process
- Active portfolio management
  - Interest rate expectation strategies
  - Yield curve strategies
- Indexing