Bond & Yield Curve Basics

Fred Eisel
SVP, Chief Investment Officer
Objectives

- Bonds Basics
- Definition of yield & duration
- Yield curve
- Yield curve shapes & strategies
WHAT IS A BOND?
What is a bond?

• Definition

• Governments, corporations and municipalities

• Pay interest periodically and repays the principal at a stated time
Key Terms

• **Face Value**
  - 10,000 bonds for $1,000 each = $10 mil
  - “Face value” of each bond = $1,000

• **Coupon**
  - Annual interest rate on the bond

• **Maturity**
Risks

• Default

• Credit ratings
  • Ratings agencies
    > S&P, Fitch, Moody’s

• AAA

• C or D
WHAT IS YIELD?
What is yield?

• Yield = annual return
• Based on price and coupon
• Coupon can be fixed or floating
• Bond price may fluctuate
What is yield?

- Bonds can trade at a premium or discount
- “Par” price = 100
- Price over 100 is a “premium” price
- Price under 100 is a “discount” price
Current Yield

- Current yield = annual return

- Yield is annual coupon divided by the price
Current Yield

- Coupon rate = 3%
- Full face value = $1 mil
- Price paid = 100
- Face value = $1 mil

- Interest earned in a year = $30k
  - $1 mil X 3% (0.03) = $30k

- Current yield = 3%
  - $30k / $1 mil = 3%
Current Yield

- Coupon rate = 3%
- Full face value = $1 mil
- Price paid = $90
- Face value = $900k

- Interest earned in a year = $30k
  - $1 mil X 3% (0.03) = $30k

- Current yield = 3.3%
  - $30k / $900k = 3.3%
Yield to maturity

- Yield to maturity
- Includes all interest payments and interest earned
- Also includes price changes
Bond Concepts

• A bond price always moves in the opposite direction of its yield

• A bond’s price reflects the value of the income that it provides through its regular coupon interest payments
Price & Yield Relationship

If interest rates rise...

Yields rise

Prices fall
Price & Yield Relationship

If interest rates fall...

Prices rise

Yields fall
Price & Yield Relationship

Price is par = 100

Yield = 3%
Price & Yield Relationship

Price is par = 90

Yield = 3.3%
Price & Yield Relationship

Price is par = 110

Yield = 2.7%

3%
Duration

- How much will the price move when interest change?

- Some bonds more sensitive than others

- Measurement - duration
Duration

Coupon Payments

$$\text{Principal Repayment}$$

Duration
Duration

- Allows investors to compare bonds equally

- Measures the bond’s price change with 100 bps (1%) move in interest rates

- The longer the duration, the greater the price risk
YIELD CURVE
Yield Curve

- Line graph plotting out yields to the corresponding maturity of a bond

- Yield curves plot out yields for bonds in the same asset class
  - Treasuries
  - Municipal bonds
  - Agencies bonds
  - Corporate bonds
Yield Curve Shape

- Each yield curve has a shape or a slope

- The shape provides great information
  - Normal
  - Steep
  - Flat
  - Inverted
Normal Yield Curve

<table>
<thead>
<tr>
<th>Years</th>
<th>3mo</th>
<th>2yr</th>
<th>5yr</th>
<th>10yr</th>
<th>30yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield (%)</td>
<td>1%</td>
<td>2%</td>
<td>3%</td>
<td>4%</td>
<td>5%</td>
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</tbody>
</table>

First Carolina Corporate Credit Union
Flat Yield Curve – December 1989

<table>
<thead>
<tr>
<th>Years</th>
<th>Yield (%)</th>
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<tbody>
<tr>
<td>3mo</td>
<td>7.78%</td>
</tr>
<tr>
<td>2yr</td>
<td></td>
</tr>
<tr>
<td>5yr</td>
<td></td>
</tr>
<tr>
<td>10yr</td>
<td>7.94%</td>
</tr>
<tr>
<td>30yr</td>
<td></td>
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</table>

3mo = 7.78% 10yr = 7.94%

Difference = .10% (10 bps)
Steep Yield Curve – April 1992

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<tr>
<td>3mo</td>
<td>3.77%</td>
</tr>
<tr>
<td>2yr</td>
<td></td>
</tr>
<tr>
<td>5yr</td>
<td></td>
</tr>
<tr>
<td>10yr</td>
<td>7.59%</td>
</tr>
<tr>
<td>30yr</td>
<td></td>
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Difference = 2.16% (216 bps)
Inverted Yield Curve – March 2000

Yield (%)

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<tr>
<td>3%</td>
<td></td>
<td></td>
<td></td>
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<td>4%</td>
<td></td>
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<tr>
<td>5%</td>
<td></td>
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<td></td>
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<tr>
<td>6%</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>7%</td>
<td></td>
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2yr = 6.50% 30yr = 5.83%

Difference = -0.67% (67 bps)
Uses of the Yield Curve

- Predictor of the economy
- Benchmark for pricing other assets
- Investors can implement yield curve strategies
Portfolio Strategies - Ladder

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Portfolio Strategies - Barbell

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Years: 3mo, 2yr, 5yr, 10yr, 30yr

Yield (%): 1%, 2%, 3%, 4%, 5%, 6%
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“Rolling Down the Curve”

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Years: 3mo, 2yr, 5yr, 10yr, 30yr

Yield (%): 1%, 2%, 3%, 4%, 5%, 6%
Conclusion

• Bonds, price, yield, and duration

• Yield curves

• Strategies
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