The Behavior of Interest Rates ( ... how to explain)

From chapter 4:

**bond prices** and **interest rates** are *inversely* related

⇒ whatever determines bond prices must also (implicitly) determine interest rates

Sooooo.....

What determines bond prices?

Supply & Demand (!)

The theory of asset demand & supply

**Asset demand, determinants of ...**

<table>
<thead>
<tr>
<th>Determinant</th>
<th>Effect on demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) expected (relative) return</td>
<td>+</td>
</tr>
<tr>
<td>b) wealth</td>
<td>+</td>
</tr>
<tr>
<td>c) risk (relative)</td>
<td>-</td>
</tr>
<tr>
<td>d) liquidity (relative)</td>
<td>+</td>
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**Asset supply, determinants of**

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<td>a) Cost of capital (YTM)</td>
<td>-</td>
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<tr>
<td>b) expected profitability</td>
<td>+</td>
</tr>
<tr>
<td>c) government deficit</td>
<td>+</td>
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Let the bond in question be a zero coupon 1-year t-bill w/ $1000 face value

⇒ **expected return** = \( \frac{FV-P}{P} = YTM \)

where

- FV = face value
- P = price of bond
- YTM = yield to maturity

Why equal to YTM?

by definition of YTM,

\[ P = \frac{FV}{1+YTM} \]

ergo

\[ \frac{FV}{P} = 1+YTM \]

\[ FV/P - 1 = YTM \]

\[ (FV - P)/P = YTM \quad \text{q.e.d.} \]

Example:

- let P = 900 ⇒ expected return = \( \frac{1000-900}{900} = 11.1\% \) = YTM
- let P = 800 ⇒ expected return = \( \frac{1000-800}{800} = 25\% \) = YTM
- etc.

(Graph curve for bonds, CETERIS PARIBUS)
Meanwhile, on the supply side of the market ...

What is the "cost of capital" to the borrower?

Borrower receives "P" (price of bond) upon initial sale
Borrower pays periodic coupon and face value at maturity

On a 1 year zero-coupon,

\[ \text{cost of capital} = \frac{\text{FV} - P}{P} = \text{YTM} \]

Example:

Let

\[ \begin{align*}
P=600 & \quad \Rightarrow \quad \text{cost of capital} = \frac{1000 - 600}{600} = 66\% = \text{YTM} \\
P=700 & \quad \Rightarrow \quad \text{cost of capital} = \frac{1000 - 700}{700} = 43\% = \text{YTM} \\
\end{align*} \]

(Graph supply curve of bonds, CETERIS PARIBUS)
The "Liquidity Preference" Framework
... of J.M. Keynes

Focus on "Money Market" instead of "Bond Market"

An alternative framework to "Loanable Funds"

Better suited to analyze business cycle and other short-run fluctuations

Note about LFF: bond supply inelastic in very short run

Also: Money market much more volatile than bond market.

... 

Assume two assets, **Money**, and **Bonds**

People decide what portion of their wealth to hold in each form

What's the price of money?

Roughly speaking, the interest rate
Why? b/c it's the opportunity cost of not holding a bond instead
(assuming bond pays the interest rate, and ignoring
capital gains on bonds)

The higher the interest rate, the higher the cost of holding money,
and the more people will squeeze their liquidity for the sake
of higher returns

**Determinants of money demand:**

i - (the interest rate): determines opportunity cost of not holding bonds

Y - (nominal income): determines "transactions demand" for money

P - (the price level): determines the "real balances” people hold

E(P) - (the expected price level): determines the **real** rate of return on money
6-Month T-Bill Yield
Nominal vs Real 3-Month Interest Rate

Data Source: Federal Reserve Bank of St. Louis (FRED)