

# The Yield Curve, Stocks, and Interest Rates

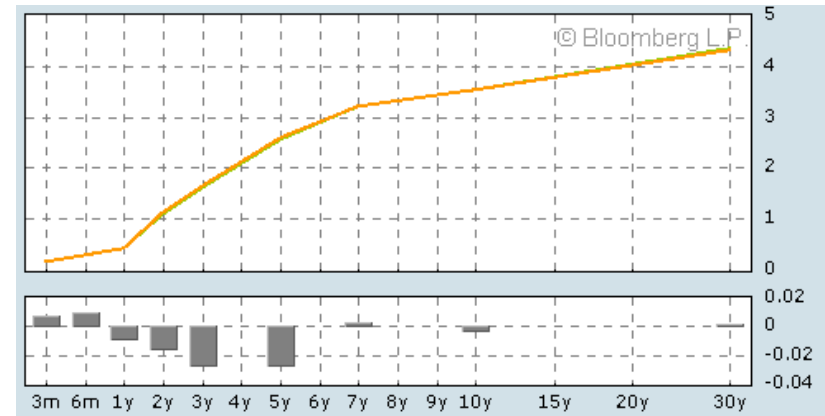
Bonds with identical risk, liquidity, and tax characteristics have different interest rates based on time to maturity.

**YIELD CURVE** – graph of bond yields for bonds with the same risk/liquidity/tax considerations but different maturities - this starts with the shortest maturities (on the right) and progresses to longer maturities (farthest right)  
- **Most of the time, this is used with only Treasury bills and bonds**

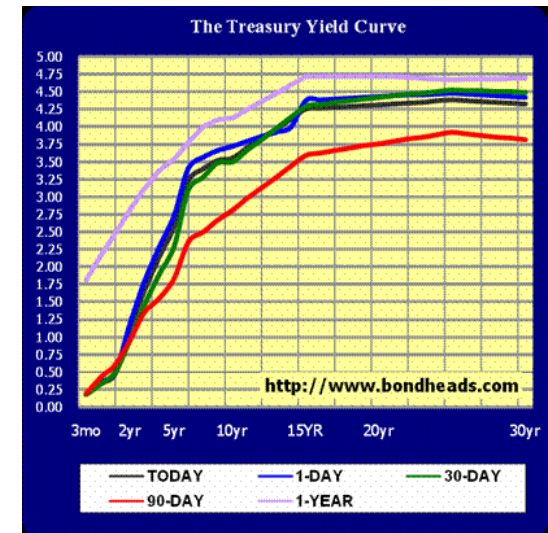
Typically, the Yield Curve is upward sloping, and longer-term bonds ( $r_L$ ) have higher rates than shorter-term bonds ( $r_S$ )

You can view the Yield curve either from Bloomberg.com (URL: <http://www.bloomberg.com/markets/rates/index.html>) or Bondheads.com (URL: <http://www.bondheads.com/>).  
- For Bloomberg.com, there are tabs to observe the Yield Curves for several other countries.

The Yield Curve as of 6/26/09 (from Bloomberg.com):



The Yield Curve from Bondheads.com



The Yield Curve is:

- (1) Related to inflation and growth expectations
- (2) Affected by monetary policy
- (3) **A real-time economic forecast by the bond market**

**Q:** How is this an economic forecast?

**A:** Use the interest rate model outlined earlier in the course:

$$r = f(\text{expected inflation, economic growth, monetary policy})$$

If interest rates are rising with longer durations (upward sloping yield curve), then *short-term rates are expected to rise in the future.*

When do interest rates rise? Using the model, when either:

- (1) expected future inflation is rising;
- (2) expected future economic growth is expected to occur; and in some circumstances:
- (3) monetary policy is viewed as or expected to be too “easy.”

- Note that these factors are *not* independent of each other: higher growth leads to greater expected inflation. IF monetary policy is viewed as being too “easy,” this will produce inflationary growth.

So, an upward-sloping Yield Curve is a forecast of economic growth to occur (or continue) in the future.

- the steeper is an upward-sloping curve, the more growth and/or inflation is expected in the future.

The steeper is the yield curve, the more the financial sector will benefit (favorable for financial stocks).

- Banks obtain funds by acquiring short-duration funds and loaning over greater time periods. The difference between these rates for banks,  $r_L - r_S$ , is called their **net interest margin (NIM)**, which is directly related to bank loan profitability.

- So, the steeper is the yield curve, the greater is NIM, and the better will be bank profitability. This explains why the financial stocks tend to “outperform” the overall stock market when the economy is doing well (and expected to continue doing well)

It should be fairly obvious that when the Yield Curve flattens, banks become less profitable, as NIM falls, and if the Yield Curve becomes inverted (longer-term rates below short-term rates), bank profits disappear and financial stocks begin to underperform.

**Q: What does an inverted Yield Curve indicate (as the bond market forecast)?**

**A:** That economic growth will decline in the future, very possibly resulting in a recession (the potential recession timing is 6 – 18 months in the future).

**Q: What causes the Yield Curve to become inverted?**

**A:** Often this results from monetary tightening. As the Fed tightens, short-term rates (which the Fed affects directly) rise relative to longer-term rates. Small businesses find it increasingly difficult to obtain (or afford) short-term financing (Relate this also to the financial sector).

## Tracking the yield curve slope using StockCharts.com

**Q: Is there a quick way to see if an inversion of the Yield Curve is occurring?**

A: Yes. Keep track of the interest rate spread between the 10-year US Treasury bond and the 3-month US Treasury Bill:  $r_{10yr.} - r_{3mo.}$

***When this spread turns negative, the bond market is predicting economic weakness and possibly a recession in the future.***

***- It is very likely that the yield curve will flatten prior to inverting, so a decreasing spread is a signal of possible economic difficulties ahead.***

**CNBC** uses the difference between the 10-year and the 2-year Treasury bond rates as its measure of the Yield Curve's shape. *Empirically, this spread has a very mediocre track record in predicting economic weakness and/or recession.*

- Note, though, the 2-year Treasury bond rate is often highly correlated with monetary policy.

Using StockCharts.com it is possible to view the (correct) yield slope by viewing the 3-month t-bill rate relative to the 10-year rate

The symbols for these in StockCharts.com are:

**\$TNX** – ten-year US government bond rate

**\$IRX** – 3 month US t-bill rate

It is necessary to use the ratio of these, which is done using a semicolon (;) between the two symbols. Taking the 10-year relative to the 3-month rate, the symbol to enter into StockCharts.com is:

**\$TNX:\$IRX**

Next, change from either a Candlestick or OHLC chart to a line chart. To do this, below the chart, select **Line(Solid)** from type and press **Update**.



The red and black line is the proxy for the yield curve slope. Included in this graph for contrast is a growth-oriented index, the NASDAQ (symbol \$COMPQ).

- Note how the yield curve slope and the NASDAQ tend to be positively correlated over the time period of the chart. The steeper is the yield curve, the better the stock market performs. This is consistent with the earlier discussion.
- Observe that over this time period, yield curve changes tend to precede changes in the NASDAQ, indicating that ***the bond market is a leading indicator over this period.***
- For the last several days at the end of the chart, the yield curve has flattened (the level of that curve has fallen). This implies a short-term pull back in the NASDAQ is coming.
- Finally, keep in mind that by only examining the relationship between two variables (yield curve steepness and the NASDAQ), there will be exceptions to the relationship patterns as “other things” enter into the economic picture.

## INTEREST RATES AND THE STOCK MARKET

**STOCK (Equity)** – a security that gives the holder a share of the ownership of that company

- The holder is entitled to dividends (if paid) + price changes in that stock
- Technically, the stock holder has a claim on part of the earnings and assets of that company and the right to vote at stock holder meetings
- Stockholders are ***residual claimants*** (they get assets only after everyone else)

**DIVIDEND** – a portion of company profits paid to share holders (quarterly)

### WHAT IS THE VALUE OF A STOCK?

- Value and price are not always synonymous

Price is determined by supply and demand

Value – technically this is the present value of expected *future* cash flows over the time the stock will be held

- This can include dividends and future price

### RETURN TO A STOCK:

- consists of price appreciation/depreciation and dividend yield (if dividends are paid)

$$\text{RET} = \text{DIV}/P_s + \Delta P_s/P_s$$

where  $\text{DIV}/P_s$  is the dividend yield (dividend as percentage of stock price) and  $\Delta P_s/P_s$  is the capital gain/loss, and  $P_s$  is the stock price at the beginning of the period.

Focusing on the capital gains/loss term, the time pattern of capital gains/losses depends on whether:

- 1) This stock is in a cyclical industry
- 2) If it depends on foreign operations and sales, and
- 3) Expected profit (based on (1) and (2))
- 4) Interest Rates ( $r$ )

Generally, interest rate changes cause a reallocation of assets between:

- Stocks
- Bonds and
- Money

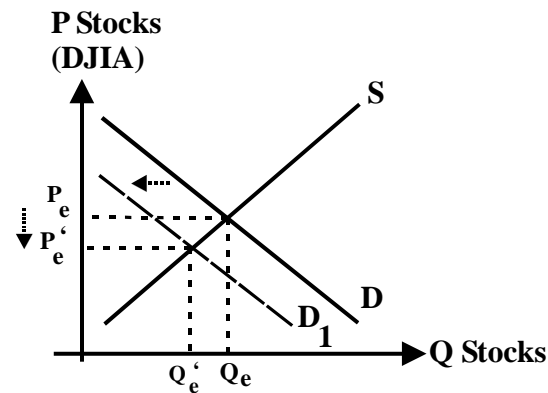
There will be substitutions between these classes, resulting in different percentages allocated in each category.

To see the impact of interest rate increases on stock prices, use supply and demand analysis:

## How do rising interest rates affect stock prices?

- Rising interest rates make CD's and other interest earning (i.e., fixed income) assets *relatively* more attractive as investments than stocks
- CD's & Bonds - *substitutes* for stocks

Higher interest rates  $\Rightarrow$  lower *demand* for stocks, causing stock prices to fall



**“Rising interest rates are a head wind for the stock market.” This explains generally poor stock market performance when the Fed tightens.**

## Interest Rates and Stock Prices (again)

When the Fed lowers interest rates:

- (1) Immediately - **Asset Substitution** – return to fixed income assets falls (ex: lower savings account rates, higher bond prices), making these relatively less attractive than stocks, causing an increase in stock purchases
- (2) Medium term – as  $r \downarrow$ , the demand for interest-sensitive goods (ex: durable goods, housing) rises, along with their complementary goods, increasing the value of expected profit (numerator in present value calculations)
- (3) Longer-term – given the  $\downarrow r$  and higher expected profits, the present value of future profit rises

**Generally, when the Fed lowers interest rates, the stock market advances (and vice versa).**

## STOCKS vs BONDS

Bonds become relatively more attractive when interest rates are expected to fall (ex: a slowing economy or lower expected inflation translate into lower rates and higher bond prices – try telling that to a senior citizen!)

Assume the economy is expected to slow in the future (and no inflation worries):

Stocks: expected future profit falls, making stocks relatively less attractive, *lowering* their demand

Bonds: this lowers expected future inflation making bonds relatively more attractive, *raising* their demand

⇒ **bond for stock substitution**

**Result: lower stock prices AND lower interest rates**

(which reflects higher bond prices)

- This makes bonds a recession hedge, their higher demand called a “**flight to safety**”

**All of this becomes less obvious when both growth and inflation are expected to change**

Ex: oil prices rise enough to bring recession fears. This generally causes a bond market rally which lowers interest rates, as it is believed that weakness or recession will lower inflation

To re-do something from earlier in the semester with more depth:

**Assume that good economic news occurs** (ex: large jump in employment, big fall in unemployment rate, or large GDP figure)

- indicates a strengthening and growing economy

This will tend to signal the likelihood of higher future inflation, raising inflationary expectations

We said earlier, that this increase in inflationary expectations will raise nominal interest rates. How does this occur? Let's look at both the bond and stock markets.

### **Bond (Fixed Income) Market**

- good news and heightened inflation fears lead to a **bond market selloff**  $\Rightarrow \downarrow P_b$  as the real value of fixed income is expected to fall

$\Rightarrow r$  as the inflationary premium rises

### **Stock (Equity) Market**

- as  $r \uparrow$ , stocks become relatively less attractive in terms of asset substitution, BUT

- good news signals higher profit expectations, which is beneficial to stock prices

Generally, the effect on higher expected profit will dominate the asset substitution impact, so stock prices will rise in response to the good information

**RESULT:**  $\uparrow P_s$  and  $\downarrow P_b$  with stock for bond substitution

**We observe:  $\uparrow P_s$  and  $\uparrow r$**

## **SECTOR ROTATIONS**

Asset markets provide **real-time** signals about expected future economic conditions

If something signals the economy will be stronger in the future (ex: good economic news)

- Money will "rotate" into sectors attuned to economic growth (economically sensitive areas). Look for breakouts in these sectors as they outperform the overall stock market. Their behavior will be a leading indicator of future activity. Sectors:

- **Consumer Cyclical**s (\$CYC)
- **Consumer Discretionary Stocks** (XLY)
- **Industrials** (XLI)
- **Materials** (XLB)
- **Commodities** (\$CRB)
- **Energy** (XLE)
- **Technology** (XLK)

Money "rotates" into these economically sensitive sectors.

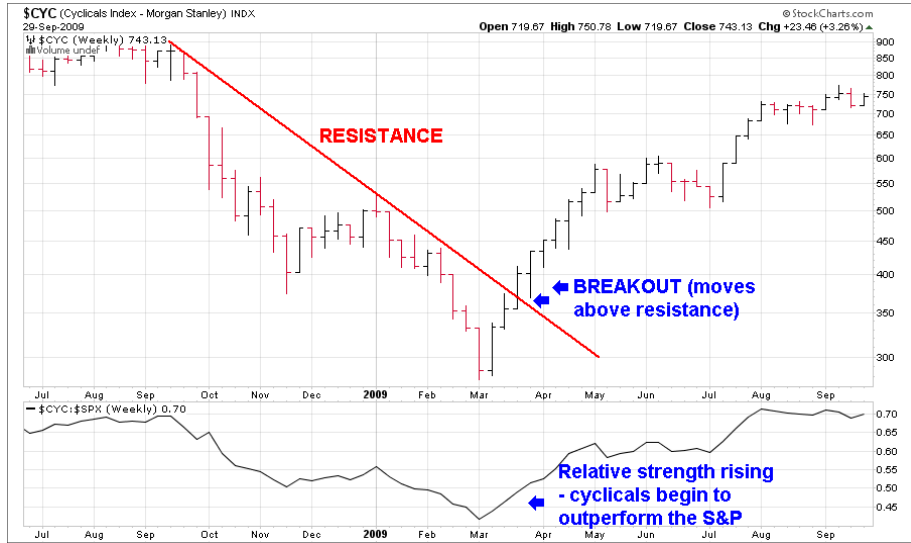
Q: Where does this money come from?

A: **Defensive Sectors**

- **Consumer Staples** (XLP)
- **Health Care** (XLV)
- **Utilities** (XLU)

These sectors will breakdown (fall below support) as they underperform the overall market.

Illustration: In March, 2009 Cyclical (\$CYC) experienced a breakout, moving above resistance, and began to outperform the S&P 500 (relative strength turned to positive slope)



**The breakout by Cyclical preceded the economic recovery which began (it appears) in Q3 of 2009.**  
***Cyclicals thus performed as a leading economic indicator, well ahead of “stale” GDP reports that would not come out for some time.***

Let’s go back in time and see if Cyclical were a leading indicator for recession.

The graph shows that Cyclical broke down (fell below support) in late 2007, again leading the turn in the economy (the “official” start of the recession was December 2007).

