At any point in time there are a large number of bonds that differ in yields....WHY?
- Risk Characteristics
- Tax Characteristics
- Liquidity Characteristics
- Maturity

The Term Structure of interest rates refers to the yield differences that are entirely due to maturity.

A plot of yields versus maturity is referred to as the Yield Curve.

So: Yield Curve and Term Structure are two ways of saying the same thing.
A recent plot of yields (from February 11) on Government Securities
Historical plot of Long-Term and Short-Term Rates

Figure 5.4
Short-Term and Long-Term Interest Rates

Note: Long rates are typically greater than short rates:
Yield curve is typically upward sloping.
The critical question: why do bonds with different maturities have different yields?

- The most common answer: The Expectations Hypothesis of the Term Structure.
- The current yields on bonds with different maturities reflects investors expectations of future interest rates.
- Basic intuition: the yields on holding a long term bond until maturity is equal to the expected yield from purchasing a sequence of short bonds.
- Consider a simple setting: just one- and two-year bonds. And suppose there is no uncertainty. Then arbitrage requires

\[(1 + i_{2t})^2 = (1 + i_{1t})(1 + i_{1t+1})\]
The expectations hypothesis replaces the future rate with its expected value:

\[(1 + i_{2t})^2 = (1 + i_{1t}) E_t [(1 + i_{1t+1})] \]

Define the implied one-period forward rate as:

\[(1 + f_{1t}) = \frac{(1 + i_{2t})^2}{(1 + i_{1t})} \]

The forward rate is an unbiased predictor of the future spot rate:

\[(1 + f_{1t}) = E_t [(1 + i_{1t+1})] \]

One of the most tested relationships in finance!!
The forecasts of interest rates based on the expectations hypothesis.
Comparing the accuracy of the forecasts – short and long term
A brief aside: Expectations Hypothesis belongs to a large class of models. Expectations Based theories of asset pricing

What determines the price of stock (i.e. equity)? In a world of certainty, it would be the present discounted value of dividends:

$$p_t = \sum_{i=1}^{\infty} \frac{\text{div}_{t+i}}{(1 + r)^i}$$

With uncertainty in dividends, replace with expected value:

$$p_t = \sum_{i=1}^{\infty} \frac{E_t (\text{div}_{t+i})}{(1 + r)^i}$$
A brief aside: Expectations Hypothesis belongs to a large class of models. Expectations Based theories of asset pricing

What explains the difference in interest rates between two countries? The expected change in the exchange rate:

Let $S_t$ denote the price of foreign currency in term of domestic currency. Example Euros – then the exchange rate is:

$$\frac{S_t \$}{1 \€}$$

Note: an *increase* in the exchange rate is a *devaluation* in the home currency.
Consider two strategies: buy a dollar denominated bond or use the dollar to buy euros, then buy a euro denominated bond, then use the proceeds to buy dollars at time $t+1$. If no uncertainty, then we must have:

$$\frac{(1 + i^u_t) \, $t+1}{1$} = \frac{1}{S_t} \, \frac{(1 + i^euro_t) \, \epsilon_{t+1}}{1 \, \epsilon_t} \, \frac{S_{t+1} \, $_{t+1}}{1 \, \epsilon_{t+1}}$$

Or:

$$\frac{(1 + i^u_t)}{(1 + i^euro_t)} = \frac{S_{t+1}}{S_t}$$
A brief aside: Expectations Hypothesis belongs to a large class of models. Expectations Based theories of asset pricing with uncertainty, replace future exchange rate with its expected value (this is uncovered interest rate parity):

\[
\frac{(1 + i_t^{us})}{(1 + i_t^{uk})} = \frac{E_t (S_{t+1})}{S_t}
\]

If the one-year interest rate in the US is 10% greater than in Euroland, then this implies that the dollar is expected to devalue by 10% over the next year.
The yield curve seems to predict recessions.