

Intro to Bonds

Brain Teaser

Two of these cities lie on the same line of latitude. Which two?

Philadelphia

Delhi

Venice

Beijing

Toronto

(Bonus: which city is furthest North?)



Solution: Brain Teaser

Answer: Philadelphia and Beijing !!!!!!!

Bonus: Venice





What is a bond?

- ❖ “Fixed Income”
- ❖ Price of a bond
- ❖ Interest
- ❖ Principal
- ❖ Zero Coupon vs. Coupon





Bond Terminology

- ❖ Face Value
- ❖ Principal
- ❖ Coupon
- ❖ Yield
- ❖ Premium
- ❖ Discount
- ❖ Par



Relationship between bond price and yield

- ❖ Relationship between bond price and yield
- ❖ Indicator of capital flows in a country
- ❖ Moves on economic data, geopolitical events, central bank policy changes
- ❖ Good reflection of “risk” priced into a country



Time Value of Money

❖ “A dollar today is worth more than a dollar tomorrow”

❖ Why?



How to Value a Bond

- ❖ Present Value- Discounting future cash flows by discount rate to arrive at what that cash flow would be worth today
 - ❖ Discount rate – opportunity cost of investing in some other asset
 - ❖ Risk free rate – what is the Risk Free rate?
- ❖ In case of a bond:
 - ❖ Discount interest payments and principal

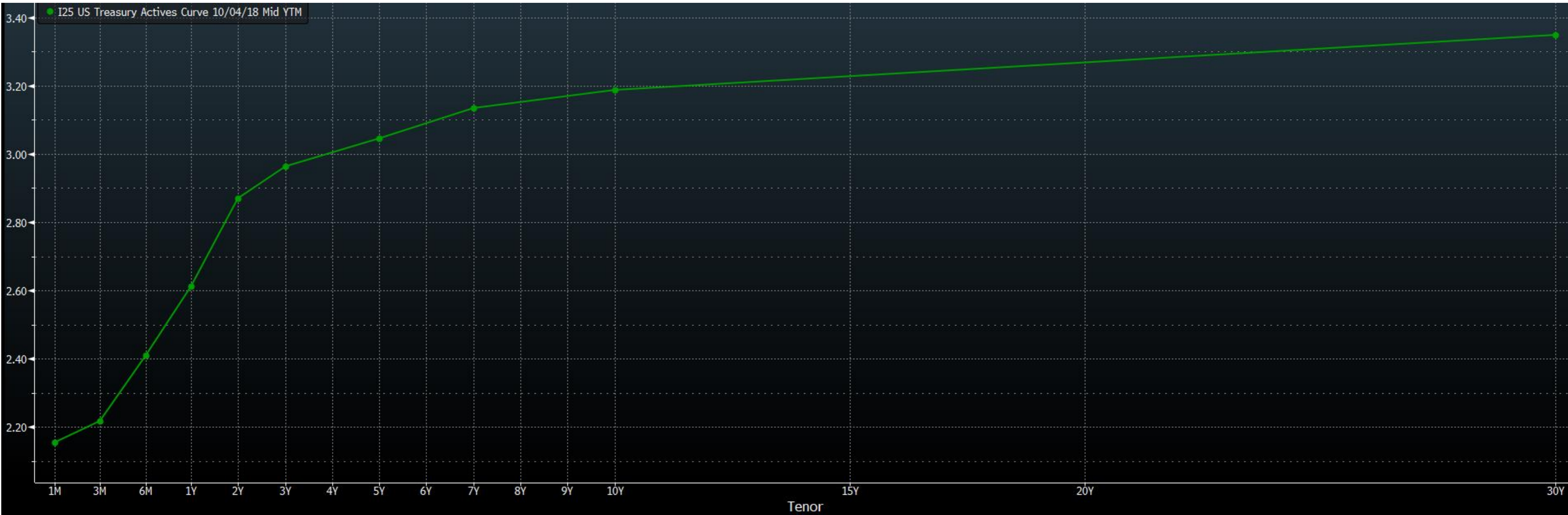
How to Value a Zero Coupon Bond vs Coupon Bond

- ❖ 1 year ZCB pays out principal of 100. Assuming a discount rate of 5%, what should that bond be worth today?
- ❖ 2 year coupon bond pays interest annually of 4% of 100 principal. Assuming discount rate of 5% what should bond be worth today?
 - ❖ Around \$98

Yield Curve

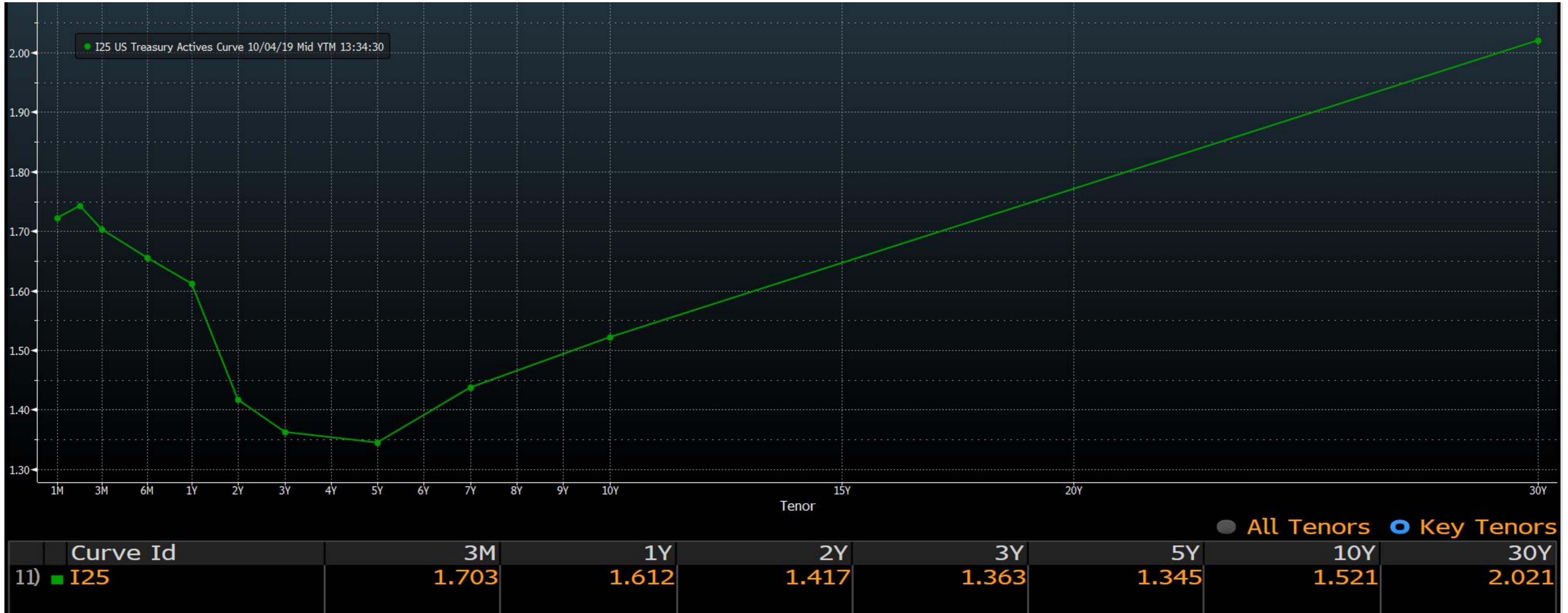
- ❖ Yield curve- plots yields on bonds of different maturity dates
- ❖ What should it look like?
- ❖ What is inversion?
- ❖ Why does yield curve inversion happen?

US Yield Curve 10/4/2018



Curve Id	3M	1Y	2Y	3Y	5Y	10Y	30Y
11) ■ I25	2.217	2.612	2.870	2.963	3.046	3.188	3.348

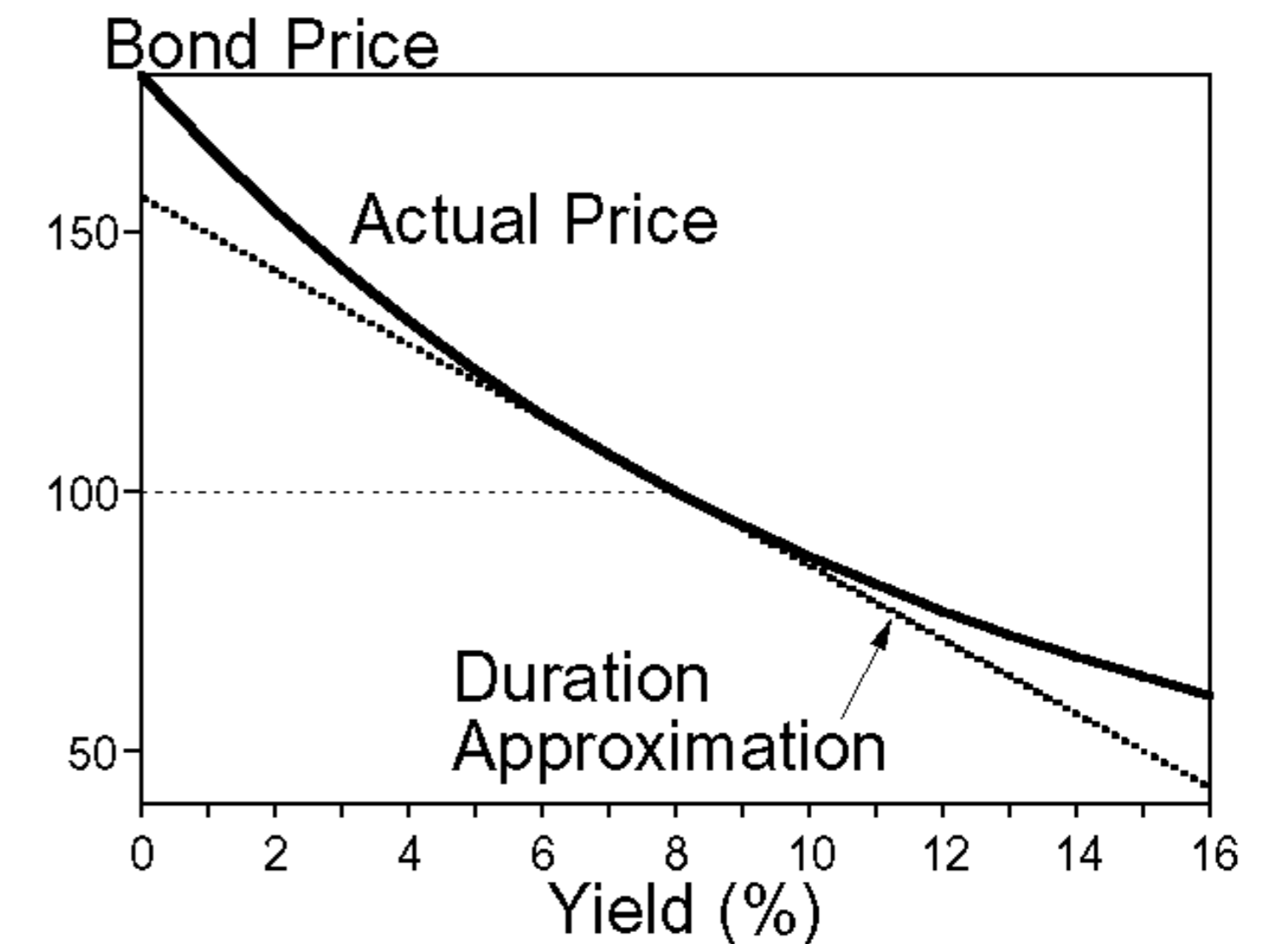
US Yield Curve 10/4/2019



Duration

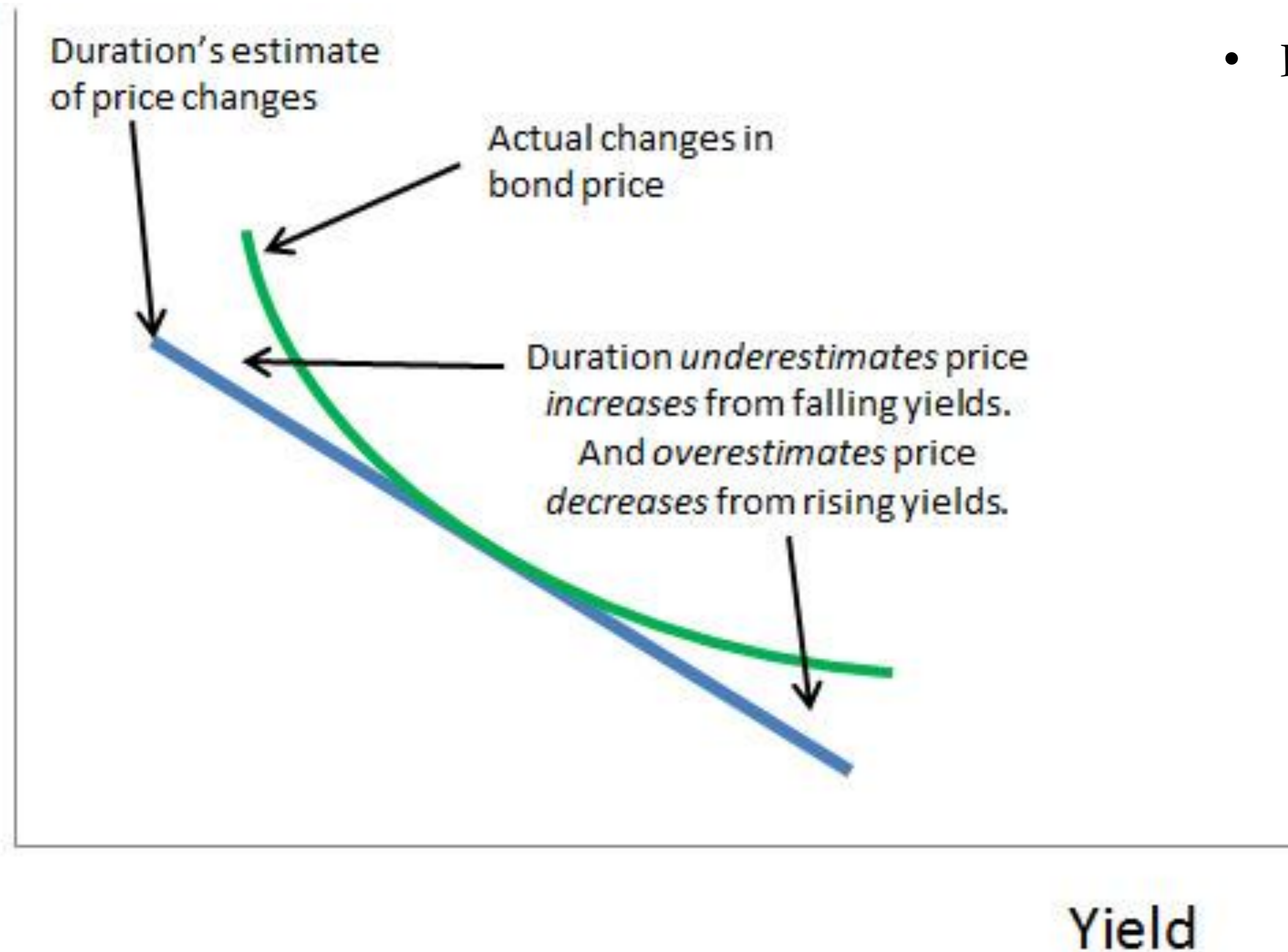
- 1st derivative of a yield curve
 - Intuition: Change in price of a bond for a 1% change in the interest rate

- Can be considered approximation of average payback period of the bond
 - What is duration of a zero coupon bond?
 - What happens to duration when...
 - For longer tenured bond vs short tenured bond
 - For higher coupon vs low coupon
 - When yields on a bond rise?



Benefits of Duration? – Why use convexity?

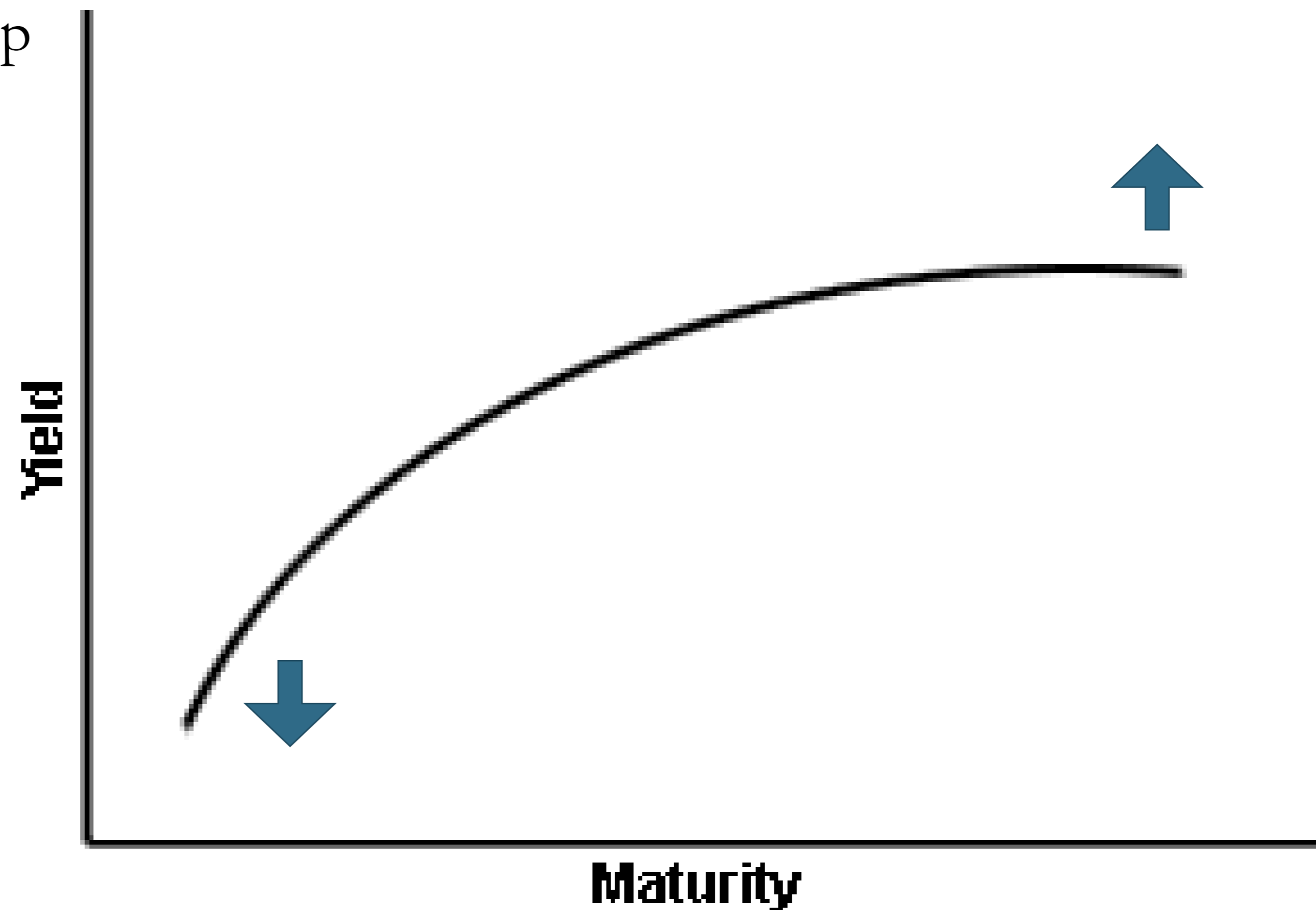
Bond
Price



- For hedging
 - Limits exposure to changing rates
 - But, not perfect (other methods for estimating this sensitivity)

Trading Bonds: Steepener

- Long short end of the yield curve – yields go down
- Short long end of the yield curve - yields go up
- Cost of the trade
- What would a flattener be?



Steepener Trade

- ❖ When would we use this?
- ❖ Duration hedging during bond trades
- ❖ Difficulties of trade – curves rarely steepen

TIPS

- Treasury Inflated Protected Securities
- How it works:
 - Interest Payments increase with increases in inflation
 - Example :
 - Principle : 100
 - Interest: 5%
 - CPI inflation measure: 2%
 - Interest: $(100 * 1.02) * 0.05$
- Nominal vs. Real Returns – Which is this?
- When would you want to own TIPS?

Breakeven Inflation : Market Expectations

- ❖ Difference in yield of TIPS and US Treasury
 - ❖ What investors expect inflation to be
 - ❖ What do you think has happened to the spread in yields over time?