### Yield for Money Market Instruments

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<td>Spot rate yield curve (zero curve, strip curve)</td>
<td>Yield curve for given zero coupon bonds</td>
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<td>Yield curve for coupon bonds</td>
<td>Yield curve for a given coupon bonds (yields are expressed on a semi annual basis)</td>
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<td>Par bond yield curve (par curve)</td>
<td>Reflect the coupon rate that bond at each maturity would need to have to be price at par (YTM of a par bond at each maturity)</td>
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<td>Forwards yield curve</td>
<td>Show the future rates for bonds for the same maturities (typically 1 year) for annual periods in the future (quoted on a semi annual bond basis)</td>
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### Relationship between ST forward rates and spot rates

- Borrowing costs @ X-year spot rate = Borrowing costs for one-year periods in X successive years
  
  \[(1 + S_0)^X = (1 + S_0) \times (1 + 1y1y) \times (1 + 2y1y) \times \ldots \times [1 + (X - 1)y1y]\]

### Yield spread

- Yield spread: difference between yields of 2 different bonds
- Benchmark spread: yield spread relative to a benchmark bond
- G-spread: yield spread over a government bond
- I-spread (Interpolated spread): yield spread related to swap rate in the same currency, with the same tenor as a bond
- Z-spread: yield spread over the spot curve
- Option-adjusted spread: remove the effect of option out of Z-spread measure
  - Option-adjusted spread = Z-spread - option value

**Advantage:** To analyse the factors that affect bond's yield
- Bond's yield ↑; Yield spread remains the same → ↑ benchmark yield → macroeconomic factors caused bond yield to increase
- Bond's yield ↑; Yield spread ↑ → Microeconomic factors (credit risk, issuer's liquidity) caused bond yield to increase

### Present Value (PV) Formulas

\[PV = FV \times \left(1 - \frac{Days}{Year} \times Discount\ rate\right)\]

\[PV = \frac{FV}{\left(1 + \frac{Days}{Year} \times Add-on\ rate\right)}\]

- Bond-equivalent yield: add-on yield based on a 365-day year