Bond Factors:

* Fama and French 3 Factors Model: Uses PCA to divide the factors for CAPM by Level （水平因子）, Slope （斜率因子）, and Convexity (曲度因子)
  + 市场资产组合(*Rm*− *Rf*)
  + 市值因子(SMB) [Small minus Big]
  + 账面市值比因子(HML) [High Minus Low]
  + Extended into the FF 5 Factors Model to Include Bond Market trends
    - Explanatory but not predictive
    - Involves additional Credit Risk (Default Risk) and Maturity Risk (Term Risk)
      * Doesn’t explain REITs [Real Estate Investment Trusts] and low grade corporate bonds
* Sharpe, Lintner, and Black (SLB model): the market portfolio of invested wealth is mean-variance efficient [CAPM index]
  + The efficiency of the market portfolio implies that expected returns on securities are a positive linear function of their market betas [the betas are the slope in the regression of a security’s return on the market’s return]
  + Market betas suffice to describe the cross-section of expected returns
    - Fama and French argue that BE/ME is sufficient in determining the bond return
* Fama Bliss Regression Model
* Cochrane Piazzesi (CP) Factors Model
  + Studies time variation in expected excess bond returns [regressions of one-year excess returns on initial forward rates]
    - A single factor, a single tent-shaped linear combination of forward rates predicts excess returns on one- to five- year maturity bonds
      * Unrelated to level, slope, and curvature
* Litterman’s 3 Factors Model for Bonds:
  + Loading: sensitivity of a bond’s return to a common factor
* The **expectations hypothesis** of the term structure of interest rates (whose graphical representation is known as the yield curve) is the proposition that the long-term rate is determined purely by current and future expected short-term rates, in such a way that the expected final value of wealth from investing in a sequence of short-term bonds equals the final value of wealth from investing in long-term bonds.