Discount Bond Price: *Price of n-year discount bond at time t*

$$P_t^{(n)}$$

Log Bond Price:

$$p_t^{(n)} = logP_t^{(n)}$$

Log Bond Yield:

$$y_t^{(n)} = -\frac{1}{n}p_t^{(n)}$$

Log Forward Rate:

$$f_t^{(n-1\rightarrow n)} = p_t^{(n-1)} - p_t^{(n)}$$

Log Holding Period Return:

$$r_{t+1}^{(n)} = p_{t+1}^{(n-1)} - p_t^{(n)}$$

Excess Log Return

$$rx_{t+1}^{(n)} = r_{t+1}^{(n)} - y_t^{(1)} = p_{t+1}^{(n-1)} - p_t^{(n)} - y^{(1)}$$

Average Excess Log Return (across maturity):

$$\overline{rx}_{t+1} = \frac{1}{4}[rx_{t+1}^{(2)} + rx_{t+1}^{(3)} + rx_{t+1}^{(4)} + rx_{t+1}^{(5)}]$$

(Cochrane & Piazzesi) Single Factor:

$$CP_t = \gamma_0 + \gamma_1 y^{(1)} + \gamma_2 f_t^{(1\rightarrow 2)} + \gamma_3 f_t^{(2\rightarrow 3)} + \gamma_4 f_t^{(3\rightarrow 4)} + \gamma_5 f_t^{(4\rightarrow 5)} = \gamma^T f_t$$