4.1 Eq. premium puzzle

- In macro, $\varphi$ can be derived in repr. agent Ramsey-type model (see Romer C-CAPM) using CRRA specification

$$\tilde{R}_a - R_0 = \theta \text{cov} \left( \tilde{C}, \tilde{R}_a \right)$$

where $\theta = CRRA$.

- Empirical evaluation (1890-1979) for US market portfolio

1. LHS = av. return on stock market - av. return on short term gov’t debt

$$\cong 0.06.$$  

2. RHS: std. dev. growth in real consumption $\sigma_c = 0.036, \sigma_a = 16.7, \rho_{ca} = .40$

$$\Rightarrow \text{cov} \left( \tilde{C}, \tilde{R}_a \right) = 0.036 \times 0.167 \times .4 = .0024$$

- Find $\theta$ to satisfy this

$$\theta = .06 / .0024 \cong 25 \ (=91 \ for \ post-war \ period)$$

Unbelievably high risk aversion to make model consistent with observations: Equity premium puzzle