

A Note for Mehra and Prescott (1985)

Paul Weifeng Dai
University of Chicago

This Version: Nov 2021
First Version: Nov 2021

Abstract

This note is a short summary of Mehra and Prescott (1985). This paper is on Section 6: Asset Pricing of ECON 330 Theory of Income I reading list at University of Chicago.

1. Question: Whether large differential in risky and riskfree asset can be accounted by friction absent Arrow-Debreu setup?
2. Answer: No. At least some equilibrium model with a friction.
3. Intuition: with real per capita consumption growing at about 2% per year, the elasticity of substitution $1/\sigma$ are sufficiently small to yield 6% average equity premium also yield are much higher real interest rates than the data.
4. Data:
 - (a) Annual growth rate of per capita consumption: 2%
 - (b) Annual growth rate of short-term debt: less than 1%
 - (c) Annual growth rate of SP500: 7%
5. Model:
 - (a) Stand-in household maximize expected life-long discounted utility from consumption
 - (b) CRRA utility (RRA coefficient σ).
 - (c) Firm's dividend payment y is rate of equity $y' = x'y$ following a Markov process $x' \in \{\lambda_1, \dots, \lambda_n\}$.
 - (d) Price of security reflects future dividends payment

$$P_t = \mathbb{E}_t \left[\sum_{s=t+1}^{\infty} \beta^{s-t} U'(y_s) d_s / U'(y_t) \right] \quad (1)$$

which is homogeneous of degree 1 with respect to consumption c under CRRA and can be solved as a fixed point.

6. Results:
 - (a) Set of admissible average equity risk premium and real return in Figure 1
 - (b) The observed real return of 0.80 and equity premium of 6% is inconsistent with the model
 - (c) This inconsistency is quite robust even considering
 - i. Measurement issue (inflation, growth of consumption, risk-free real rate, tax considerations etc)
 - ii. Effects of firm leveraging
 - iii. Production instead of exogenous endowment

Figure 1: Figure 4 of [Mehra and Prescott \(1985\)](#)

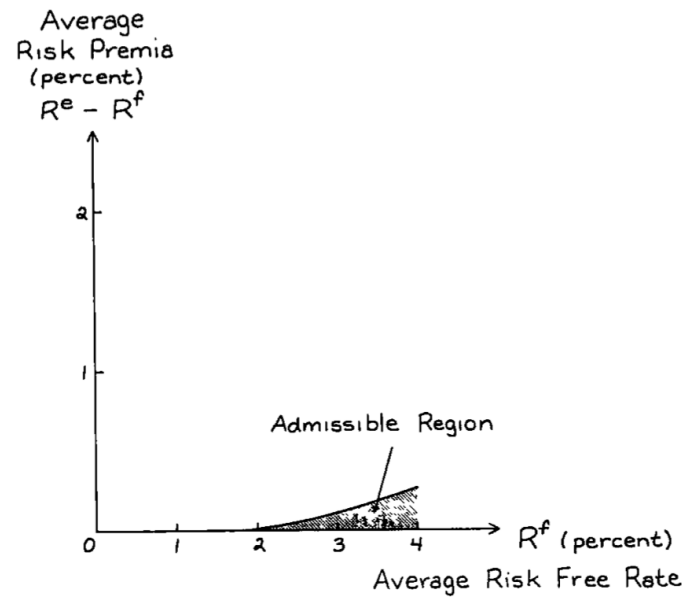


Fig. 4. Set of admissible average equity risk premia and real returns.

References

MEHRA, R. AND E. C. PRESCOTT (1985): "The equity premium: A puzzle," *Journal of monetary Economics*, 15, 145–161.