BUSI 521 /ECON 505
Asset Pricing Theory / Financial Economics
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MIDTERM EXAM

This exam is closed book and closed notes. There are three questions, and they will be equally weighted.

1. Assume there are three states of the world that are equally likely. There are two assets with prices $p_1 = p_2 = 1$. The payoffs of the first asset across the three states of the world are $(1, 2, 1)$. The payoffs of the second asset across the three states of the world are $(0, 1, 3)$.
   (a) Describe the one-dimensional family of state price vectors.
   (b) Find the SDF that is spanned by the assets.
2. Assume there is a risk-free asset and multiple risky assets with joint normal returns.
   (a) Derive the optimal portfolio for an investor with CARA utility.
   (b) Show that the return of the investor's optimal portfolio is a pricing factor.
3. Use the Bellman equation to derive the optimal portfolio for a log utility investor with an infinite horizon. You can assume that returns are iid.