

# ECON 6090 - TA Section 11

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## Exercise - MWG 6.C.15

Assume that, in a world with uncertainty, there are two assets. The first is a riskless asset that pays 1 dollar. The second pays amounts  $a$  and  $b$  with probabilities of  $\pi$  and  $1 - \pi$ , respectively. Denote the demand for the two assets by  $(x_1, x_2)$ .

Suppose that a decision maker's preferences satisfy the axioms of expected utility theory and that he is a risk averter. The decision maker's wealth is 1, and so are the prices of the assets. Therefore, the decision maker's budget constraint is given by

$$x_1 + x_2 = 1, \quad x_1, x_2 \in [0, 1]$$

- a. Give a simple necessary condition (involving  $a$  and  $b$  only) for the demand for the riskless asset to be strictly positive.
- b. Give a simple necessary condition (involving  $a$ ,  $b$  and  $\pi$  only) for the demand for the risky asset to be strictly positive.
- c. From now on assume the conditions in (a) and (b) are satisfied. Write down the first order conditions for utility maximization in this asset demand problem.
- d. Assume that  $a < 1$ . Show by analyzing the first order conditions that  $\frac{dx_1}{da} \leq 0$ .
- e. Which sign do you conjecture for  $\frac{dx_1}{d\pi}$ ? Give an economic interpretation.
- f. Can you prove your conjecture in (e) by analyzing the first order condition?