

ADVANCED FINANCIAL THEORY

14.12.2004

TIME: 5 h

Calculator can be used

1. Two assets have the following pay-offs after one period, at two alternative states.

Asset	Pay-off, state 1	Pay-off, state 2	Current price
A	10	20	13
B	30	10	19

a.) A third asset C with payoffs of 20 in state 1, and 5 in state 2, is introduced in the economy. Using a no-arbitrage argument, calculate what C must cost.

b.) What is the risk-free rate in the economy ? (10 p)

2 a.) Describe and derive the CAPM without a risk-free rate (Blacks zero-beta model).

b.) Can the CAPM really be tested ? Explain the logic in Roll's (1977) critique. (10 p)

3. The risk-free rate is 6%, and the expected returns for stocks in India, Russia and China are 15%, 17% and 17%, respectively. You have also estimated the following variance-covariance matrix between these 3 countries:

	India	Russia	China
India	0.003	0.001	0
Russia	0.001	0.002	0.001
China	0	0.001	0.003

a.) Find the weights of the Minimum Variance Portfolio (MVP).

b.) Find the weights of the Tangency Portfolio.

(10 p)

4 a.) Suppose that you are completely indifferent between exercising early a call option that you own, and holding on to it for another day. (You are fully knowledgeable about when, if at all, to rationally exercise your call.) Tomorrow, the underlying stock trades ex-dividend.

You receive new information: interest rates have just sharply risen (the stock price is however unaffected). Given that you previously were indifferent between exercising your call early, and holding on to it, would the interest rate rise cause you to change your view, and how ? Also, derive the decision rule (a formula) which answers the question of whether to exercise early or not in the above situation.