Toulouse School of Economics
École d'économie de Toulouse

UNIVERSITÉ TOULOUSE 1 CAPITOLE

Université Toulouse 1 Capitole
Ecole d'économie de Toulouse

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Session 1

Semestre 2

Master 1 Economics, Econometrics Statistics
Epreuve : Market Finance
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Market Finance Exam 2016-2017

March 2017

1 Questions (Justify your answer.) (6 points)

1. When we test the efficient market hypothesis and find abnormal returns in the data, can we conclude that the market is not information efficient?
2. Is CAPM formula theoretically different from P=E(mx)?
3. Suppose there is an asset with positive alpha (i.e., an asset that "beats the market"), is it optimal to allocate a large proportion of your wealth on this asset?
4. Briefly describe the Fama-French 3-factor model.

2 Risk preference (4 points)

Suppose an investor's utility function is $U(w) = \sqrt{w}$. He holds a portfolio, whose value is \$900 in the good state, \$400 in the medium state, and \$100 in the bad state. 3 states are equally weighted.

1. Compute the Arrow-Pratt absolute and relative risk aversion.
2. Compute his expected utility and the certainty equivalent?
3. There is a put option that gives the right to sell the portfolio at \$400, and it costs \$76. Will the investor buy it?
4. Suppose the investor originally has borrowed some money to invest, and he needs to repay the debt in the end. Will the investor buy the put option? (Argue it without calculation.)

3 CAPM (3 points)

Assume the CAPM is valid. You are given the following information. (Note: P_0 is the price of the asset in period 0, and P_1 the price in period 1.) Fill in the blanks.

Stock	r_f	$E(r_m)$	$E(r)$	β	P_0	$E(P_1)$
A	3%	9%			100	112
B	5%	10%		2	100	
C	4%		10%	$\frac{2}{3}$		60

4 Arrow-Debreu Securities (7 points)

Suppose there are 3 possible states at $t = 1$, equally distributed. We assume portfolio formation. Let the existing securities be given by:

$$X = \begin{pmatrix} x^1 & x^2 & x^3 \end{pmatrix} = \begin{pmatrix} 1 & 2 & 0 & 1 \\ 0 & 1 & 2 & 1 \\ 1 & 0 & 0 & 1 \end{pmatrix}.$$

1. Are there redundant securities?
2. Is the market complete?
3. Let the price vector be given by

$$P = \begin{pmatrix} 0.5 \\ 1.3 \\ 0.6 \\ 1 \end{pmatrix}.$$

Is the law of one price satisfied?

4. Now, let the price vector be:

$$P = \begin{pmatrix} 0.5 \\ 1.3 \\ 0.6 \\ 0.8 \end{pmatrix}.$$

Is the law of one price satisfied? Is there a stochastic discount factor (SDF) in the asset space? If yes, what is it? Is it the only one? Can you find a strictly positive SDF? Is the no arbitrage condition satisfied?

5. Now, let the price vector be:

$$P = \begin{pmatrix} 0.6 \\ 1.3 \\ 0.6 \\ 0.9 \end{pmatrix}.$$

Is the law of one price satisfied? Is there a SDF in the asset space? If yes, what is it? Is it the only one? Can you find a strictly positive SDF? Is the no arbitrage condition satisfied?