

OLLSCOIL NA hEIREANN
NATIONAL UNIVERSITY OF IRELAND, GALWAY

SUMMER EXAMINATIONS 2002

SEMINAR IN THE ECONOMICS OF FINANCIAL MARKETS I (EC 410)

B. Sc. in Financial Mathematics and Economics

Professor H. Dixon
Professor M.P. Cuddy
Dr. S. Fountas

Time allowed: TWO hours

Please answer THREE questions.

1. (i) (13 pts) Derive the expression for the expected return on asset i under the CAPM.
- (ii) (7 pts) Show that the systematic risk of an asset is determined by the beta of the asset.
- (iii) (5 pts) Explain the meaning of the following: $\beta = 1$, $\beta > 1$, and $\beta < 1$.

2. (i) Let P_t be a stock price at time t and $P_{t+1} = E_t P_{t+1} + \varepsilon_{t+1}$

where $E_t P_{t+1}$ = expected stock price at time $t+1$ based on information available up to time t , and ε_{t+1} = forecast error

- (a) (5 pts) Explain the required properties of ε_{t+1} for stock market efficiency.
- (b) (5 pts) Explain which of these properties are violated if ε_t follows an AR(1) model, i.e.,

$$\varepsilon_{t+1} = \rho \varepsilon_t + v_t,$$

$$v_t = \text{white noise}$$

- (ii) Let $R_{t+1} = E_t R_{t+1} + \varepsilon_{t+1}$ (1)

where R_{t+1} = return on stocks at time $t+1$

ε_{t+1} = forecast error

and $E_t R_{t+1} = k = \text{constant}$ (2)

- (a) (5 pts) Assuming that the return R_t reflects only the expected capital gain from price changes (i.e., dividends = zero), show that the model (1)-(2) leads to a random walk model in the log of stock price.

- (b) (5 pts) Use this random walk model to explain whether the anomalies of the weekend effect and the January effect are consistent with the efficient market hypothesis (EMH).
- (iii) (5 pts) Explain how one would test empirically the informational efficiency aspect of the EMH using survey data. What is the advantage of using survey data in testing for efficiency in relation to tests performed in the absence of survey data?
3. (i) (7 pts) Compare and contrast the following models of exchange rate determination in terms of their assumptions:
- Flexible price monetary model
 - Frankel's real interest rate differential model
 - Portfolio balance model
 - Dornbusch's exchange rate overshooting model
- (ii) (11 pts) Derive the equation for the equilibrium exchange rate under the
- Flexible price monetary model
 - Frankel's real interest rate differential model
- (iii) (7 pts) Explain algebraically and intuitively the meaning of exchange rate overshooting using the Dornbusch model. Which of the assumptions of the model are crucial in obtaining the overshooting result?
4. (i) (12 pts) Using per-period interest rates, show algebraically that under the Pure Expectations Hypothesis (PEH), the n-period bond interest rate is approximately an arithmetic average of expected future one-period rates. What assumptions are necessary for your derivation?
- (ii) (6 pts) Using the regression-based approach, explain how to test the validity of the PEH.
- (iii) (7 pts) Explain the concepts of duration and portfolio immunisation.
5. (i) (12 pts) Derive the covered interest parity (CIP) and uncovered interest parity (UIP) conditions and state the assumptions of each condition.
- (ii) (8 pts) Derive the real interest parity condition. What assumptions does this condition depend on?

- (iii) (5 pts) Explain the use of the regression approach in testing for the uncovered interest parity condition under rational expectations and a zero risk premium.