



3. (10 points) You manage Dartmouth College Endowment. You are considering moving a quarter of your \$2 billion US equity portfolio into the Japanese stock market. The expected return and standard deviation of returns in the US market are 10% and 14% respectively. The expected return and standard deviation of the Japanese market's returns, measured in US dollars, are 12% and 17%, respectively. The correlation coefficient of returns between the two markets is 0.6. If you moved the money, what would the portfolio's standard deviation of returns be?
4. (6 points) Suppose you are offered an investment that pays 11.55% continuously compounded. How long will it take for your money to double?
5. (6 points) An investment costs \$125 and produces cash inflows of \$15 per year in perpetuity. What is the IRR of this investment?

6. (7 points) Mr. DiCaprio has \$100 today and the market interest rate is 10% per year. Mr. DiCaprio also has an investment opportunity in which he can invest \$50 today and receive \$60 next year. Suppose Mr. DiCaprio consumes \$20 this year and invests in the project. What is the maximum amount he can consume next year?
7. (10 points) You have been asked to value orange groves belonging to Roll Corporation. The groves produce 1.6 billion oranges per year. Oranges currently sell for \$.10 per 100. With normal maintenance, this level of production can be sustained indefinitely (assuming no unexpected hard freezes occur). Variable costs (primarily upkeep and harvesting) are \$1.2 million per year. Fixed costs are negligible. The nominal discount rate is 18%, and the inflation rate is 10%. Assuming that orange prices and the variable costs change with inflation, what is the value of the groves? (Ignore taxes and depreciation).
8. (10 points) Your savings account at Ledyard Bank pays interest of 4% APR, compounded semi-annually. If you want to have a balance of \$100,000 in an account after 15 years, what constant amount must you deposit in each and every *six month period* (first deposit in 6 months)?

9. (6 points) The internal rate of return and NPV rules generally lead to the same decision for independent projects. However, in some cases the IRR rule either fails or does not provide an unambiguous result. Describe these circumstances. Give an example. Remember, we are considering only independent projects.

10. (10 points) The following table provides information on returns on a stock in three states of the economy:

State of the economy	Probability of state	Return
Rapid growth	.20	.30
Moderate growth	.60	.15
Recession	.20	-.05

- a. (3 points) Calculate the expected rate of return for the stock.
- b. 7 (points) Calculate the variance and the standard deviation of returns for the stock.
11. (10 points) The Cape Cod Cranberry Company has been harvesting cranberries and producing cranberry sauce since 1749. The demand for cranberry sauce has

