**FIN104 Tutorial Answers - Week 9**

1. **Project Analysis. True or false? (CH10-Q3)**
2. Sensitivity analysis can be used to identify the variables most crucial to a project’s success.
3. Sensitivity analysis is used to obtain expected, optimistic, and pessimistic values for total project cash flows.
4. Rather than basing one’s estimate of NPV just on expected cash flows, it makes more sense to average the NPVs calculated from the pessimistic and optimistic estimates of cash flow.
5. Risk is reduced when a high proportion of costs are fixed.
6. The break-even level of sales for a project is higher when break-even is defined in terms of NPV rather than accounting income.

**Answer:**

1. True - Sensitivity analysis can be used to identify the variables most crucial to a project’s success.
2. False - Sensitivity analysis is used to obtain expected, optimistic, and pessimistic values for total project cash flows.
3. False - Rather than basing one’s estimate of NPV just on expected cash flows, it makes more sense to average the NPVs calculated from the pessimistic and optimistic estimates of cash flow.
4. False - Risk is reduced when a high proportion of costs are fixed.
5. True - The break‐even level of sales for a project is higher when break‐even is defined in terms of NPV rather than accounting income.
6. **Break-Even Analysis. The following estimates have been prepared for a project (CH10-Q10):**

Fixed costs: $20,000

Depreciation: $10,000

Sales price: $2

Accounting break-even: 60,000 units

**What must be the variable cost per unit?**

**Answer:**

At the break-even level of sales (60,000 units) profit would be zero:

*Profit = [60,000\*(2 – variable cost per unit)] – 20,000 – 10,000 = 0*

Solve to find that variable cost per unit = $1.50.

1. **Risk Premiums.** Here are rates of return on a broad stock market index and on Treasury bills between 2013 and 2017 **(CH11-Q6)**:

**Table

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1. What was the risk premium on common stock in each year?
2. What was the average risk premium?
3. What was the standard deviation of the risk premium?

**Answer:**

a.



b. The average risk premium was 14.85%.

c. The variance (the average squared deviation from the mean) was 1.21%. Therefore, standard deviation = 11.01

1. **Real versus Nominal Returns. You purchase 100 shares of stock for $40 a share. The stock pays a $2 per share dividend at year-end. (CH11-Q8)**
2. What is the rate of return on your investment if the end-of-year stock price is (i) $38; (ii) $40; (iii) $42?
3. What is your real (inflation-adjusted) rate of return if the inflation rate is 4%?

**Answer:**

**a. (i)**



**a. (ii)**



**a. (iii)**



**b.**







1. **Table

   Description automatically generatedScenario Analysis. Consider the following scenario analysis(CH11-Q13)**
2. Is it reasonable to assume that Treasury bonds will provide higher returns in recessions than in booms?
3. Calculate the expected rate of return and standard deviation for each investment.
4. Which investment would you prefer?

**Answer:**

a. Interest rates tend to fall at the outset of a recession and rise during boom periods. Because bond prices move inversely with interest rates, bonds provide higher returns during recessions when interest rates fall.

b. *r*stock = [0.2 × (−.05)] + (0.6 × .15) + (0.2 × .25) = .13 or 13.0%

*r*bonds = (0.2 × .14) + (0.6 × .08) + (0.2 × .04) = .084 or 8.4%

Variance (stocks) = [0.2 × (−.05 − .13)2] + [0.6 × (.15 − .13)2] + [0.2 × (.25 – .13)2] = .0096

Standard deviation =

Variance (bonds) = [0.2 × (.14 − .084)2] + [0.6 × (.08 − .084)2] + [0.2 × (.04 − .084)2] = .001024

Standard deviation = 

c. Stocks have both higher expected return and higher volatility. More risk-averse investors will choose bonds, while those who are less risk-averse might choose stocks.

1. **Diversification. Here are the returns on two stocks. (CH11-Q19)**

**Table

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1. Calculate the variance and standard deviation of each stock. Which stock is riskier if held on its own?
2. Now calculate the returns in each month of a portfolio that invests an equal amount each month in the two stocks.
3. Is the variance more or less than halfway between the variance of the two individual stocks?

**Answer:**

1. The calculation of risk is in the following tables. Digital Cheese carries more risk with a standard deviation of 6.9 versus 4.8 for Executive Fruit:



1. The portfolio returns and variance are calculated as follows:



1. The portfolio standard deviation is 5.5, which is less than the average of 5.9.
2. **Market Risk. Which firms of each pair below would you expect to have greater market risk? (CH11-Q22)**
3. General Steel or General Food Supplies
4. Club Med or General Cinemas

**Answer:**

1. General Steel should be exposed to higher market risks than General Food Supplies, since the industrial market is more cyclical than staple markets.
2. General Cinemas should be exposed to higher market risks than Club Med, since the movies are consumed with disposable income, while healthcare is a defensive sector.