

LO.a: Distinguish among realized holding period return, expected holding period return, required return, return from convergence of price to intrinsic value, discount rate, and internal rate of return.

1. The price and payout data for Alpha Inc. is given below:

Price as of 30 th Jun 2016	\$ 59.60
Expected Price as of 30 th Jun 2017	\$ 68.30
Expected Dividend on 30 th Jun 2017	\$ 5.00
Expected Dividend to be paid on 1 st Sep 2017	\$ 2.00
Bonus shares expected on 1 st Sep 2017	15%

The holding period return of Alpha Inc. for the year ended June 2017 is *closest* to:

- A. 23%
 - B. 26%
 - C. 41%
2. Which of the following statements is *most likely* true?
- A. When the expected return is greater than the required return, the stock is overvalued.
 - B. The required return on a stock is the maximum return the investor requires from investing in that stock.
 - C. When markets are efficient, the IRR may be equal to the required return.

LO.b: Calculate and interpret an equity risk premium using historical and forward-looking estimation approaches.

3. A drawback of using historical models to estimate equity risk premium is that:
- A. the mean and variance of historical data are constant over time.
 - B. historical data is only reflective of companies that were present during the time of measurement.
 - C. a string of unexpected positive or negative events balance out over the period of the sampled data.
4. An analyst is computing a forward looking equity risk premium for Country A's equity market using the following data on its local S&R 300 index.

S&R 300 Index Data	
Dividend yield based on next year aggregated forecasted dividends	2.0%
Consensus long-term earnings growth rate	3.5%
20-year government bond yield	4.0%

The forward-looking equity risk premium for Country A is *closest* to:

- A. 5.5%
- B. 1.5%
- C. 2.5%

LO.c: Estimate the required return on an equity investment using the capital asset pricing model, the Fama–French model, the Pastor–Stambaugh model, macroeconomic multifactor models, and the build-up method (e.g., bond yield plus risk premium).

5. Given the following information, the required return on equity for ABC Co. using the capital asset pricing model is *closest* to?

Risk free rate	5.0%
Dividend Yield	8.0%
Expected growth	2.0%
Equity Risk premium	6.0%
Beta	1.3

- A. 12.8%
B. 10.0%
C. 6.3%

6. The following data is given for Pharma Inc.:

Risk free rate	3.0%
Return on a value weighted market index	5.0%
Average return on small cap portfolios	10.0%
Average return on large cap portfolios	8.0%
Average return on high book to market portfolios	12.0%
Average return on low book to market portfolios	9.0%
Liquidity premium	3.0%
β^{mkt}	1.1
β^{liq}	0.3
β^{size}	0.4
β^{value}	-0.1

The required equity return using the Fama-French model is *closest* to?

- A. 5.2%
B. 5.7%
C. 6.6%

7. The following data is given for Pharma Inc.:

Risk free rate	3.0%
Return on a value weighted market index	5.0%
Average return on small cap portfolios	10.0%
Average return on large cap portfolios	8.0%
Average return on high book to market portfolios	12.0%
Average return on low book to market portfolios	9.0%
Liquidity premium	3.0%
β^{mkt}	1.1
β^{liq}	0.3
β^{size}	0.4
β^{value}	-0.1

The required equity return using the Pastor-Stambaugh model is *closest* to?

- A. 5.2%
- B. 5.7%
- C. 6.6%

8. Beta Co. operates in the Cement sector which sees upswings during booms and downswings during economic busts. The analyst wishes to calculate its required return based on a macroeconomic factor model. The risk free rate is 4.0%. Identified factor values along with their sensitivities are given below:

Factor	Value	Sensitivity
Confidence Risk	2.0%	0.3
Time Horizon Risk	3.5%	0.2
Inflation Risk	4.5%	0.8
Business-cycle risk	3.0%	1.5
Market-timing risk	1.6%	0.6

The required equity return is *closest* to:

- A. 7%
 - B. 6%
 - C. 13%
9. XYZ Ltd. has bonds outstanding that have 10 years remaining to maturity. The coupon is at 10% and the price at which the bonds are trading is 102.5. The YTM on the bonds is 9.6%. Estimated premium for holding the company's equity is 3.5%. The risk free rate is 7.0% and the company's beta is 1.1. The cost of equity using the bond yield plus risk premium approach is *closest* to:
- A. 6.1%
 - B. 13.1%
 - C. 10.5%

LO.d: Explain beta estimation for public companies, thinly traded public companies, and nonpublic companies.

10. An analyst is estimating the cost of equity for Company A, and uses regression to estimate the value of beta. The regression estimate of beta is 1.6. The risk free rate is 5.0% and the average market index return over the last five years is 11.0%. The analyst adjusts the raw beta for beta drift and estimates the cost of equity. The cost of equity using CAPM with an adjusted beta is *closest* to:
- A. 22.6%
 - B. 13.4%
 - C. 14.6%

LO.e: Describe strengths and weaknesses of methods used to estimate the required return on an equity investment.

11. The strength of the Pastor-Stambaugh model is that it adds a factor to the Fama-French model to compensate for the:

- A. market risk of a stock.
- B. degree of liquidity of a stock.
- C. exposure to financial distress.

LO.f: Explain international considerations in required return estimation.

12. The models used to estimate the required return and risk premium of for emerging equity market are the:
- A. CAPM and multifactor models.
 - B. Gordon growth model and the Fama-French model.
 - C. country spread model and the country risk rating model.

LO.g: Explain and calculate the weighted average cost of capital for a company.

13. The following table gives the components of costs of capital and capital structure of M-Benz Ltd.

Costs of Capital	(%)
Cost of equity	13%
YTM of M-Benz long bond	6%
Tax rate	30%
Book value of debt	\$600
Book value of equity	\$800 million
Market value of debt	\$630 million
Market value of common equity	\$870 million

The WACC of M-Benz is *closest* to:

- A. 10%.
- B. 9%.
- C. 11%

LO.h: Evaluate the appropriateness of using a particular rate of return as a discount rate, given a description of the cash flow to be discounted and other relevant facts.

14. The appropriate discount rate for discounting cash flow to equity is:
- A. WACC.
 - B. cost of debt.
 - C. required return on equity.

Solutions

1. **A** is correct. The holding period return is $[(68.3 - 59.6 + 5)/59.6] = 23\%$. Section 2.1.
2. **C** is correct. When markets are efficient, stock price equals its intrinsic value, the IRR thus calculated can be used to estimate the required rate of return. A is incorrect because when the expected return is greater than the required return the stock is undervalued. B is incorrect because the required return is the **minimum** return required by investors. Section 2.
3. **B** is correct. A drawback of using historical models to estimate equity risk premium is that only those companies that were performing well enough to survive are included in the sample. This is known as survivorship bias. Companies that ceased to exist are not part of the measurement sample hence the risk premium can be inflated. Section 3.1.
4. **B** is correct. Using Equation 6: Equity risk premium = Div. yield on index based on next year aggregated forecasted dividends & aggregate market value + long-term earnings growth rate - current long-term government bond yield. $Equity\ risk\ premium = 2.0\% + 3.5\% - 4.0\% = 1.5\%$. Section 3.2.
5. **A** is correct. Using the CAPM, the cost of equity is Risk free rate + (Beta x Equity Risk premium) = $5 + (1.3 \times 6) = 12.8\%$. Section 4.1.
6. **B** is correct. Using the Fama French model, the cost of equity is $R_F + [\beta^{mkt} \times RMRF] + [\beta^{size} \times SMB] + [\beta^{value} \times HML] = 3 + [1.1 \times (5 - 3)] + [0.4 \times (10 - 8)] + [-0.1 \times (12 - 9)] = 5.7\%$. Section 4.2.
7. **C** is correct. The Pastor-Stambaugh model adds a liquidity factor to the Fama-French model. The cost of equity is therefore $R_F + [\beta^{mkt} \times RMRF] + [\beta^{size} \times SMB] + [\beta^{value} \times HML] + [\beta^{liq} \times Liquidity\ Risk\ premium] = 3 + [1.1 \times (5 - 3)] + [0.4 \times (10 - 8)] + [-0.1 \times (12 - 9)] + [0.3 \times 3] = 6.6\%$. Section 4.2.
8. **B** is correct. Using the macroeconomic multifactor model, the required return on equity is $4 + (0.3 \times 2) - (0.2 \times 3.5) - (0.8 \times 4.5) + (1.5 \times 3) + (0.6 \times 1.6) = 5.76\%$. Section 4.2.
9. **B** is correct. Using the bond yield plus risk premium approach, the cost of equity is: YTM on the company's bonds + premium for holding the company's equity = $9.6 + 3.5 = 13.1\%$. Section 4.3.
10. **B** is correct. The adjusted beta is $(1.6 \times 2/3) + (1 \times 1/3) = 1.4$. The equity risk premium is $11 - 5 = 6\%$. The cost of equity using CAPM and adjusted beta is $5 + (1.4 \times 6) = 13.4\%$. Section 4.1.
11. **B** is correct. The PSM adds a fourth factor to the FFM to account for the degree of liquidity of an equity instrument. Section 4.2.

12. **C** is correct. The two models used for required return and equity risk premium estimation for emerging markets are: the country spread model and the country risk rating model. Section 4.4.
13. **B** is correct.
$$WACC = \frac{MVD}{MVD+MVCE} r_d(1 - Tax\ rate) + \frac{MVCE}{MVD+MVCE} r.$$
$$WACC = \frac{630}{630+870} \times 0.06(1 - 0.30) + \frac{870}{630+870} \times 0.13 = 9.30\%.$$
 Section 4.4.
14. **C** is correct. The cash flow to equity is discounted by the required return on equity. Section 6.