Final Examination Answers

1. Equating the present values,

$$\frac{\$1{,}000}{(1+R)^1} + \frac{\$1{,}000}{(1+R)^2} + \ldots + \frac{\$1{,}000}{(1+R)^{10}} = \frac{\$1{,}000}{(1+R)^{11}} + \frac{\$1{,}000}{(1+R)^{12}} + \ldots$$

$$\frac{\$1{,}000}{R}\left(1 - \frac{1}{(1+R)^{10}}\right) = \frac{\$1{,}000}{(1+R)^{10}}\left(\frac{1}{(1+R)^1} + \frac{1}{(1+R)^2} + \ldots\right)$$

$$\frac{1}{R}\left(1 - \frac{1}{(1+R)^{10}}\right) = \frac{1}{(1+R)^{10}}\left(\frac{1}{R}\right)$$

$$1 - \frac{1}{(1+R)^{10}} = \frac{1}{(1+R)^{10}}$$

$$\frac{2}{(1+R)^{10}} = 1$$

$$(1+R)^{10} = 2$$

$$R = 0.0718 \ (7.18\%)$$

2. Common sense and readily available information should already be embedded in stock prices. Common sense and easy information couldn't have predicted that Resorts International would soon rise from 2 5/8 to 22 1/2. If such an increase was readily apparent, people wouldn't have sold at 2 5/8. At that price, there must have been considerable disagreement about whether the price was going to rise or fall. [Ira Cobleigh, *Parade*, March 6, 1977 (author of *Happiness Is a Stock That Doubles in One Year*).]

3. This is analogous to using dividend yields to compare individual stocks to other stocks and to bonds. Just as we need to consider the anticipated growth rate of dividends, so we should consider the anticipated growth rate of the property's income.

4. This argument and calculation assume that the estimates are unbiased and independent. In the stock market, investor opinions are not formed independently and are not free of systematic biases. They are influenced by the opinions of widely followed pundits and are shaped by cognitive errors discussed in Chapter 14. Stock prices are buffeted by fads, fancies, greed, and gloom—what Keynes called animal spirits—and this contagious mass psychology causes speculative bubbles and unwarranted panics.

5. Required returns depend on what we can earn on alternative investments and our tolerance for risk and other characteristics of the investment. If I am more risk averse than you, I will use a higher required rate of return.

6. Scenario (a) favors a larger ratio of stocks to bonds in the portfolio. In scenario (a), stock and bonds returns have large standard deviations and are strongly positively correlated, which argues against the inclusion of bonds in the portfolio. In scenario (b), Treasury bonds have little risk, stocks have considerable risk, and the returns are largely uncorrelated, which favors the inclusion of bonds in the portfolio despite the relatively low expected return.

7. There is no effect in the absence of taxes, and a negative effect if taxes on dividends are taken into account. The assets of the firm remain at $180 million, while the number of shares increases to 20 million, reducing the value of each share to ($180 million/(20 million) = $19. Instead of one share valued at $20, shareholders have one share valued at $19 plus a taxable $1 dividend.

8. There are two major problems with a payback criterion:
   a. dollars in = dollars out does not ensure a positive net present value. For example, a $5,000 refinancing cost with $50/month saving has a payback period of 100 months; but the present value of $50/month for 100 months at 10% is $3383, for a net present value of –$1,617. The net present value does not become positive until 216 months have passed.
   b. A payback-period criterion ignores the value of the cash flow beyond the pay-back period. For example, a $1,000 refinancing cost with $50 monthly savings has a payback period of 20 months; but the size of the saving depends on whether there are 2 or 28 years left on the mortgage.
      To further illustrate this point, which of these three financial arrangements is the most attractive?

|	Payback Period
a. pay $1000 and save $50/month for n months	20
b. pay $2000 and save $100/month for n months	20
c. pay $6000 and save $250/month for n months	24

   Present value gives a very different answer thanes the pay-back period:

Present Value (net of financing cost)

n	option a	option b	option c
20	– $82	– $165	– $412
30	322	645	612
60	1353	2707	5766
120	2783	5567	12,918
240	4181	8362	19,906
360	4698	9395	22,488

[Georgette Jasen, "Is It Time to Refinance Your Mortgage?," *The Wall Street Journal*, September 27, 1989.]

9. The tax-shield advantage of debt is of no use if a company has no income to shield, and debt creates the possibility that creditors will force the firm into bankruptcy if it cannot make the mandated debt payments on time.

10. CAPM assumes that investors measure risk by the standard deviation. The lesson from CAPM is that some risk can be diversified away and some cannot, with the latter measured be beta.

11. To the extent stock analysts can predict changes in the economy, stock prices will change before the economy does. (Or perhaps it is changes in stock prices that cause changes in the economy). On the other hand, to the extent that the stock market is efficient, stock prices can't be predicted from well-known economic forecasts. People won't sell if it is easy to predict that stock price will soon rise, and they won't buy if price declines are easily foretold. [Kenneth L. Fisher, *The Wall Street Waltz*, Chicago: Contemporary Books, 1987, p. 62.]

12. Buffett's argument does not assume that low interest rates will increase future cash flows. For a given cash flow, low interest rates—by themselves—justify high stock prices for the same reason that they justify high bond prices. Stock are bonds in disguise. [Joe Ciolli, "A flawed argument used by Warren Buffett could be setting stocks up for 'one of the worst disasters in history'," *Business Insider*, October 15, 2017.]

13. Here is a profit graph assuming a stock price of $100 and that at-the-money calls with a strike price of $100 sell for $10, while out-of-the-money calls with a strike price of $110 sell for only $5 (because there is less chance that the stock price will rise above the strike price). Investors get more money from at-the-money calls, but do worse than the out-of-money call strategy if the stock price rises above $105.
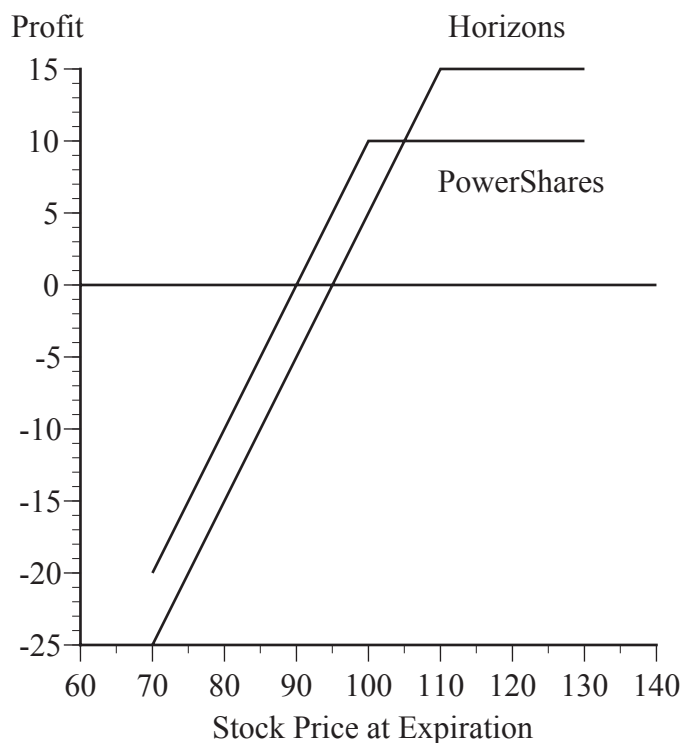
14. This is regression to the mean. Those companies that did the best in 2015 most likely benefitted from good luck in 2015 and did not do as well in earlier years because they were not as lucky in those years. [Credit Suisse, *The Base Rate Book*, September 26, 2016, Exhibit 5, p. 12.]

15. a. Yes, as here, we reject the null hypothesis that a coefficient is equal to zero even if the model only explains a small part of the variation in the dependent variable.
    b. Dual-purpose fund capital shares have considerable leverage.
    c. This positive coefficient reflect the positive returns from value strategies, with low ratios of stock prices to dividend, earnings, and assets.
    d. The intercept ("alpha") measures the extent to which the asset or portfolio gives an above-average, risk-adjusted return.

16. a. The profit rate from an expansion might be less than the shareholders' required return.
    b. Debt is a tax shield.
    c. If the firm pays dividends, shareholders must pay taxes on their dividends. If the firm repurchases stock, shareholders can choose to hold onto their stock and avoid a taxable event.

17. The company with the high dividend payout (Company 1) is fueling its growth by a high rate of return on equity, rather than, as with Company 2, retained earnings and diminished dividends—which makes Company 1 more valuable to investors.

Mathematically, using subscripts 1 and 2 for the two companies, and remembering that they have the same growth rate g:

$$g = (1 - d_1)\rho_1$$
$$g = (1 - d_2)\rho_2$$
$$d_1 > d_2 \text{ implies } (1 - d_1) < (1 - d_2) \text{ implies } \rho_1 > \rho_2$$

If shareholders apply the same required return R to both companies, the first is more valuable. [Burton G. Malkiel, *A Random Walk Down Wall Street*, 4th ed., 1985, p. 85.]

18. He sounds like a speculator who views potentially long-term assets as of no value, other than to sell to someone else for a higher price than was paid for it. Value investors can use dividends to value stocks, even if they do not need dividends for retirement. Value Investors need not hold assets forever, but they can judge an asset's price by considering whether it is justified by the cash flow, were they to hold it forever. [John Blin, quoted in H.J. Maidenberg, "Options Indexes Offer Low-Cost Diversification," New York Times, May 19, 1985.]

19. There is a lot of luck in short-term stock price movements and there is a big incentive to make very risky investments (like derivatives), because there is a reward for beating the S&P 500, but no penalty for underperforming—no matter how badly.

20. Changes in stock prices do not affect the national debt, except for the minor effects that realized capital gains have on taxes. [Trump Makes Puzzling Claim That Rising Stock Market Erases Debt, *New York Times*, By Jim Tankersley, October. 12, 2017.]