

2012 Level II Mock Exam: Morning Session

The morning session of the 2012 Level II Chartered Financial Analyst (CFA)[®] Mock Examination has 60 questions. To best simulate the exam day experience, candidates are advised to allocate an average of 18 minutes per item set (vignette and 6 multiple choice questions) for a total of 180 minutes (3 hours) for this session of the exam.

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Adam Case Scenario

Nine months ago, Makenna Adam, CFA, was dismissed from her job as an equity research analyst with Transcontinental Brokerage Company, a publicly listed nationwide stock brokerage company. Unable to find new employment, Adam establishes an Internet-based business, Adam Research Ltd, selling research reports to individuals, institutional investors, and sell-side financial services companies.

Adam recognizes she must make numerous disclosures on her website to comply with the CFA Code of Ethics and Standards of Professional Conduct and the CFA Institute Research Objectivity Standards. She feels it is important to comply with the Standards to help improve her business prospects. Adam clearly displays the following claim on the home page of Adam Research Ltd's website:

"Adam Research Ltd complies with the CFA Institute Research Objectivity Standards. This means investors can be assured all research is accurate, although actual outcomes may differ from forecasted outcomes. Our research reports clearly distinguish between facts and opinions by the analyst writing the research report."

Also clearly displayed on the home page is an additional disclosure regarding potential conflicts of interest:

"Adam Research Ltd and/or its employees and associates may from time to time hold shares in any of the companies we cover. Please contact us for disclosure concerning our share positions."

In addition, Adam creates a stock rating system, posting it on the website for her clients and potential clients so they understand the basis for how Adam Research recommendations are made. She thoroughly describes the rating system as follows: The firm uses different recommendation categories (i.e., outperform, neutral, and underperform) along with an indication regarding risks for each type of investor, time horizons, and the time frame in which the shares are expected to reach their target price.

Adam realizes she must produce research reports quickly to have product to sell. Adam's first report covers her former employer, Transcontinental, and is based in part on last year's annual report. Because she is a former employee and a shareholder in Transcontinental, Adam is convinced she knows all aspects of the company very well and decides not to meet with Transcontinental management. She publishes the report clearly stating she is a former employee and current shareholder. To drive traffic to her website, she allows free access to the report, leaving it on the site even after Transcontinental reports its year-end financial results. She receives an excellent response, with roughly 45% of her marketing list downloading the report.

The Transcontinental report captures the attention of investors due to its strong "buy" recommendation, in contrast to other analyst reports recommending a "sell." As a result, Adam is

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invited to participate in an interactive Internet chat room, where she recommends a “buy” for Transcontinental. Due to limited time, she only discloses her former employment at Transcontinental and uses the rest of the time to advertise Adam Research. On several occasions Adam mentions her website’s URL address.

To expand Adam Research’s research capability after obtaining new clients, Adam hires two analysts. Recognizing the need to have written implementation policies, as Adam is no longer the only one writing research reports, she creates policies and provides them to the new employees before posting them on the Adam Research website for clients to download. These policies are provided below in Exhibit 1.

Exhibit 1
Adam Research Ltd Company Policies and Procedures

| Policy Type | Content Description |
|---|--|
| Research Objectivity Policies | This document describes the process required to determine if there is independence and objectivity in the firm’s research, with instructions to make this policy available to all investors and employees. Procedures cited include supervisory procedures to ensure compliance, annual attestation, and adherence to internal audit requirements. |
| Compliance and Enforcement Policies | This document describes compliance policies and procedures to ensure research objectivity and lists all activities considered to be violations and the resulting disciplinary sanctions, including dismissal from the firm. |
| Personal Investments and Trading Policies | These policies are designed to manage covered employees’ personal investments and trading activities to ensure the interests of the clients are always placed before the company, its employees, and their immediate families, including prohibition of front running and participation in subject company IPOs. In addition, covered persons are banned from trading against the company’s recommendations unless for financial hardship reasons. All trades must be approved in advance. |

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1. Does the reference in Adam Research’s website to the CFA Institute Research Objectivity Standards *most likely* reflect the objectives of these Standards?
 - A. No
 - B. Yes, because Adam states actual outcomes may differ from forecasted outcomes
 - C. Yes, because Adam clearly states analyst opinions are distinguishable from facts

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Answer = A

“Guidance for Standards I–VII,” CFA Institute

2012 Modular Level II, Vol. 1, pp. 212–213

Study Session 1-4-a

Explain the objectives of the Research Objectivity Standards.

A is correct because the CFA Institute Research Objectivity Standards cannot ensure the accuracy of research reports and recommendations. Actual events often will differ from forecasts on which investment recommendations are made.

2. Adam Research’s website disclosure regarding potential conflicts of interest *least likely* meets the recommendations for compliance with the CFA Institute Research Objectivity Standards concerning the:
- A. plain language.
 - B. prominent display.
 - C. comprehensiveness.

Answer = C

“CFA Institute Research Objectivity Standards,” (AIMR, 2003; reprinted 2005)

2012 Modular Level II, Vol. 1, pp. 221–223

Study Session 1-4-b

Evaluate company policies and practices related to research objectivity, and distinguish between changes required and changes recommended for compliance with the Research Objectivity Standards.

C is correct because the disclosures given on the website are very brief and are not comprehensive and complete. They also are not designed to be informative, especially concerning share ownership of specific companies. The disclosure requirements are very comprehensive and are listed on pages 222 and 223 in Volume 1 of the CFA Institute curriculum.

3. Which category of Adam Research’s rating system could *most likely* be improved to meet the recommendations for compliance of the CFA Institute Research Objectivity Standards?
- A. Risk
 - B. Time horizon
 - C. Rating category

Answer = C

“CFA Institute Research Objectivity Standards,” (AIMR, 2003; reprinted 2005)

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2012 Modular Level II, Vol. 1, p. 223

Study Session 1-4-b

Evaluate company policies and practices related to research objectivity, and distinguish between changes required and changes recommended for compliance with the Research Objectivity Standards.

C is correct because the recommendation rating category used is relative and a benchmark, index, or objective should be clearly identified. Adam does not specify the benchmark used.

4. The research report on Transcontinental *most likely* meets CFA Institute recommendations for compliance with Research Objectivity Standards with regard to:
- A. reasonable and adequate basis.
 - B. relationships with subject companies.
 - C. timeliness of research reports and recommendations.

Answer = B

“CFA Institute Research Objectivity Standards,” (AIMR, 2003; reprinted 2005)

2012 Modular Level II, Vol. 1, pp. 219–221

Study Session 1-4-b

Evaluate company policies and practices related to research objectivity, and distinguish between changes required and changes recommended for compliance with the Research Objectivity Standards.

B is correct because Adam discloses her former relationship with the subject company as well as her shareholding in the company.

5. Did Adam’s participation in an interactive Internet chat room *most likely* comply with CFA Institute recommendations for compliance with ROS and Standards of Professional Conduct?
- A. Yes
 - B. No, because she did not make sufficient disclosures
 - C. No, because she is trying to manipulate the share price

Answer = B

“CFA Institute Research Objectivity Standards,” (AIMR, 2003; reprinted 2005)

2012 Modular Level II, Vol. 1, p. 218

Study Session 1-4-b

Evaluate company policies and practices related to research objectivity, and distinguish between changes required and changes recommended for compliance with the Research Objectivity

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Standards.

“Guidance for Standards I–VII,” *Standards of Practice Handbook*, 9th edition (CFA Institute, 2005)

2011 Modular Level II, Vol. 1, pp. 78–80, 107, 123–126

Study Session 1-2-a

Demonstrate a thorough knowledge of the Code of Ethics and Standards of Professional Conduct by applying the Code and Standards to specific situations.

B is correct because Adam failed to make sufficient disclosures by not disclosing she is a shareholder in the subject company, as required by Standard VI Conflicts of Interest and CFA Institute Research Objectivity Standards 2.0 Public Appearances. She also failed to remind audience members to judge the suitability of the investment in light of their own unique situation, Standard III (C) Suitability. Additionally, she should have disclosed to the audience whether a written research report is available, the approximate cost, and how a reader might acquire the report (CFA Institute Research Objectivity Standards, Recommended Procedures for Compliance 2.0 Public Appearances). Adam should also update the Transcontinental TRL report to include the company’s most recent results so as not to violate Standard V (A) Diligence and Reasonable Basis.

6. Which of Adam Research’s company policies and procedures given in Exhibit 1 *least likely* complies with the CFA Institute Research Objectivity Standards?
- A. Research Objectivity
 - B. Compliance and Enforcement
 - C. Personal Investments and Trading

Answer = B

“CFA Institute Research Objectivity Standards,” (AIMR, 2003; reprinted 2005)

2011 Modular Level II, Vol. 1, pp. 215–218

Study Session 1-4-b

Evaluate company policies and practices related to research objectivity, and distinguish between changes required and changes recommended for compliance with the Research Objectivity Standards.

B is correct because Adam failed to include monitoring and audit procedures and recordkeeping requirements. Candidates should note, to be in full compliance with the Research Objectivity Standards, Adam would need to address all components (11) of the Standard requirements.

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Robyn Lawrence Case Scenario

Robyn Lawrence is a senior quantitative analyst in the Global Derivatives Group of Ridgeview Capital, an investment management firm based in New York City. Lawrence is conducting a training session for two recently hired analysts, Wilma Kaplan and Anita Mehra. At the meeting, Kaplan and Mehra are asked questions about the Berkeley Corporation and are provided with the information in Exhibit 1.

Exhibit 1
Stock and Options Data for Berkeley Corporation
and Risk-Free Interest Rate

| | |
|-------------------------|----------|
| Current Call Price | \$2.30 |
| Current Put Price | \$4.70 |
| Exercise Price | \$130.00 |
| Days to Expiration* | 60 |
| Current Stock Price | \$128.55 |
| Up Move on Stock | 15% |
| Down Move on Stock | 10% |
| Risk-Free Interest Rate | 3% |

*Note: Assume a 365-day year.

Lawrence begins the meeting by stating:

Statement 1:

“You have both been asked to use the information provided in Exhibit 1 to perform certain calculations. One of your tasks was to calculate the synthetic values of call and put options for Berkeley Corporation. Can one of you tell me why it is useful to construct and value synthetic calls and puts?”

Kaplan responds, “Deriving synthetic values enables us to determine whether it is possible to earn arbitrage profits. For example, if we find that the current call price is greater than the synthetic call price then we could earn an arbitrage profit by carrying out the following transactions: selling the call, purchasing the put, and taking short positions in the stock and the bond.”

The discussion then moves on to the Black–Scholes–Merton option pricing model. Lawrence states: “The Black–Scholes–Merton option pricing model is based on a number of assumptions, including: underlying prices follow a lognormal probability distribution, the risk-free rate is known and constant, there are no cash flows on the underlying, and the options being priced are European options. What are the other assumptions of this model?” Kaplan responds:

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“The other assumptions of the model are:

Assumption 1: There are no taxes or transactions costs.

Assumption 2: The volatility of the underlying assets change through time.

Assumption 3: The prices of the underlying asset follow a lognormal distribution.”

Lawrence continues the discussion: “In the Black–Scholes–Merton model, option prices for European calls and puts are impacted by a number of variables, including time to expiration, volatility, and the risk-free rate. Can one of you explain the effect of changes in these variables on the prices of European call and put options?”

Mehra responds: “Call and put prices are higher when volatility is higher, and call and put prices are lower for higher risk-free rates. However, while call options are higher for longer time to expiration, put option prices can be higher or lower the longer the time to expiration.”

Lawrence ends the meeting with the following statement:

Statement 2:

“An important option Greek that you should be familiar with is the option delta, because traders can use this to construct hedges to offset the risks of their option positions. You should note that for in-the-money call and put options, delta approaches 1 as the option moves toward expiration.”

-
7. Based on the information provided for the Berkeley Corporation in Exhibit 1, the price of a synthetic 60-day call option with a \$130.00 strike price is *closest* to:
- A. \$3.25
 - B. \$3.88
 - C. \$5.52

Answer = B

“Option Markets and Contracts,” Don M. Chance

2012 Modular Level II, Vol. 6, pp. 171–176

Study Session 17-56-a

Calculate and interpret the prices of a synthetic call option, synthetic put option, synthetic bond, and synthetic underlying stock, and infer why an investor would want to create such instruments.

B is correct. The synthetic call option is constructed by going long the put and the stock and short the bond.

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$$\begin{aligned}\text{Synthetic call} &= p_0 + s_0 - \frac{X}{(1+r)^T} \\ &= 4.7 + 128.55 - \frac{130}{(1+0.03)^{\frac{60}{365}}} = \$3.88.\end{aligned}$$

8. Kaplan's response to Lawrence's Statement 1 is *most likely*:

- A. correct.
- B. incorrect with regard to purchasing the put.
- C. incorrect with regard to taking a short position in the stock.

Answer = C

"Option Markets and Contracts," Don M. Chance
2012 Modular Level II, Vol. 6, pp. 175–177
Study Session 17-56-a

Calculate and interpret the prices of a synthetic call option, synthetic put option, synthetic bond, and synthetic underlying stock, and infer why an investor would want to create such instruments.

C is correct. Kaplan is correct about the reason for calculating synthetic option values; it allows one to determine if it is possible to earn arbitrage profits. However, Kaplan is incorrect about the set of transactions that can be used to earn an arbitrage profit if the current price of the call option is greater than the synthetic value. The correct strategy is to sell the call option and then take long positions in the put and the stock and a short position in the bond (purchase the synthetic call). He incorrectly states that a short position should be taken in the stock.

9. Based on the information in Exhibit 1 and using a one-period binomial model, the value of a 60-day Berkeley Corporation call option with a strike of \$130.00, is *closest* to:
- A. \$6.67.
 - B. \$8.31.
 - C. \$9.00.

Answer = C

"Option Markets and Contracts," Don M. Chance
2012 Modular Level II, Vol. 6, pp. 180–183
Study Session 17-56-b

Calculate and interpret prices of interest rate options and options on assets using one- and two-period binomial models.

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C is correct. The value of the call option using the one-period binomial model is calculated as follows:

$$c = \frac{\pi c^+ + (1 - \pi)c^-}{(1 + r)} = \frac{(0.52 \times 17.8325) + (0.48 \times 0)}{(1.03)} = \$9.00 \text{ given by:}$$

$$S^+ = 128.55 \times 1.15 = 147.8325$$

$$S^- = 128.55 \times 0.90 = 115.695$$

$$c^+ = \text{Max}[0, S^+ - X] = \text{Max}[0, 147.8325 - 130] = 17.8325$$

$$c^- = \text{Max}[0, S^- - X] = \text{Max}[0, 115.695 - 130] = 0$$

$$\pi = \frac{(1 + r - d)}{(u - d)} = \frac{(1 + 0.03 - 0.9)}{(1.15 - 0.9)} = 0.52$$

10. Kaplan's response to Lawrence regarding the assumptions of the Black–Scholes–Merton model is *least likely* correct with respect to:

- A. Assumption 1.
- B. Assumption 2.
- C. Assumption 3.

Answer = B

"Option Markets and Contracts," Don M. Chance

2012 Modular Level II, Vol. 6, pp. 198–199

Study Session 17-56-c

Explain and evaluate the assumptions underlying the Black–Scholes–Merton model.

B is correct. Kaplan is incorrect. The Black–Scholes–Merton model assumes that the volatility of the underlying asset is known and is constant.

11. Mehra's response to Lawrence is *least likely* correct with respect to the impact on call and put prices of:

- A. volatility.
- B. the risk-free rate.
- C. time to expiration.

Answer = B

"Option Markets and Contracts," Don M. Chance

2012 Modular Level II, Vol. 6, p. 202

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Study Session 17-56-d

Explain how an option price, as represented by the Black–Scholes–Merton model, is affected by a change in the value each of the inputs.

B is correct. Mehra incorrectly states the relationship between the risk-free rate and the prices of call and put options. The price of a call option rises as the risk-free rate goes up. The price of a put option, however, declines as the risk-free rate rises.

12. Is Statement 2 by Lawrence *most likely* correct?

- A. Yes.
- B. No, she is incorrect with respect to calls.
- C. No, she is incorrect with respect to puts.

Answer = C

“Option Markets and Contracts,” Don M. Chance
2012 Modular Level II, Vol. 6, pp. 202–204
Study Session 17-56-d, e

Explain how an option price, as represented by the Black–Scholes–Merton model, is affected by a change in the value each of the inputs.

Explain the delta of an option and demonstrate how it is used in dynamic hedging.

C is correct. For in-the-money put options, delta approaches -1 , not 1 , as the option moves toward expiration.

El Morro Case Scenario

Raul Garcia, CFA, and Mateo Alonso are co-managers of El Morro U.S. Core Bond Fund. El Morro is a fixed income fund that is benchmarked against the U.S. Barclays Aggregate Bond Index. The fund and index contain securities in the Treasury, credit, asset-backed, and mortgage-backed sectors of the market.

Garcia and Alonso first discuss their expectations on the direction of interest rates. Garcia states: "Rates are attractive across the curve. The 7- to 10-year part of the curve looks expensive, but that should not deter us because it is driven by insurance companies hedging their liabilities." Alonso responds: "Interest rates for long maturity bonds look attractive; the risk premium appears to compensate us for the potential downside of adding duration. This premium is above the expected forward rates."

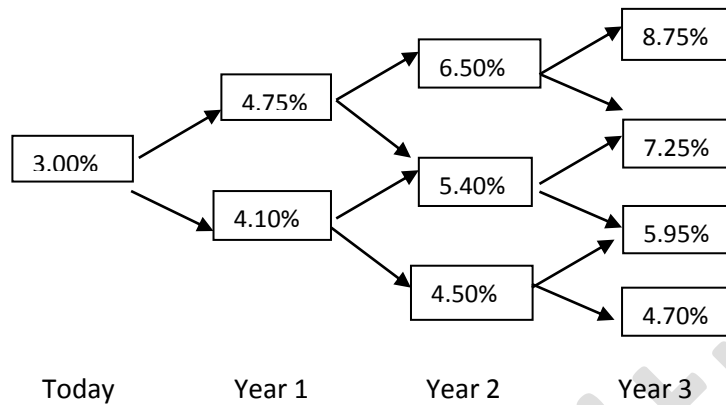
Garcia then asks Nora Costas, CFA, El Morro's corporate bond analyst, to evaluate securities in other sectors of the index. Costas offers the following observations comparing corporate bond analysis to credit analysis in other sectors:

- Observation 1: Asset-backed securities (ABS) analysis is very similar in that it is important to assess not only the collateral but also the cash flow characteristics and the operating and business risks that impact these flows.
- Observation 2: Municipal revenue bond analysis is identical, as it requires an assessment of character of management, covenants, cash flow generation, and the underlying factors that generate these revenues.
- Observation 3: Sovereign debt analysis is very similar in that it requires the qualitative assessment of economic factors, and the willingness to pay as well as the ability to pay.

Alonso then focuses on the mortgage securities in the portfolio. He asks Costas to explain what the cash flow implications are for a pool of mortgages in the portfolio. Alonso describes the mortgages in the pool as having a 20-month average age, and the pool has a monthly mortality of 0.4353%.

Costas then offers to go over her valuation of a callable bond issued by a company she has been researching. The bond is callable at \$101.50 every year starting one year from today. She uses the data in Exhibit 1 for her valuation.

Exhibit 1
Binomial Interest Rate Tree (9% Volatility Assumed)
for Valuing a \$100 Par Value 3-Year Callable Bond with a 6.25% Coupon



Alonso tests Costas' knowledge of securitized transactions by asking her to explain the tranches of the ABS securitization in Exhibit 2.

Exhibit 2
ABS Structure

| Bond Class | Par Value (\$millions) |
|-----------------|------------------------|
| A1 (senior) | 40 |
| A2 (senior) | 25 |
| A3 (senior) | 20 |
| B (subordinate) | 8 |
| C (subordinate) | 7 |
| Total | 100 |

Costas provides the following explanation: "This securitization is a sequential-pay transaction. As such, interest payments are paid to each bond class periodically. Principal repayments are applied first to the lowest tranche, in this case tranche C, to protect investors from prepayment risk. The senior-subordinate structure has been established for credit tranching to protect against defaults, with subordinated tranches sharing equally in any losses".

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Garcia then asks Costas which of the various valuation models would be most appropriate for assessing relative value. Costas responds: "It really depends on the characteristics of the security. As examples, consider the following three securities:"

Security A: 5%, non-callable 30-year corporate bond selling at a discount.

Security B: 4%, 20-year Ginnie Mae debenture callable in five years.

Security C: Zero-coupon, 10-year Treasury bond.

Costas explains that the most appropriate measures to use are a zero-volatility spread for Security A, an option-adjusted spread (OAS) for Security B, and a nominal spread for Security C.

13. Which theory of the term structure of interest rates *least likely* explains the views of either Garcia or Alonso?

- A. Preferred habitat
- B. Pure expectations
- C. Liquidity preference

Answer = B

"Term Structure and Volatility of Interest Rates," Frank J. Fabozzi

2012 Modular Level II, Vol. 5, pp. 214–222

Study Session 14-49-e

Explain the pure expectations, liquidity, and preferred habitat theories of the term structure of interest rates and the implications of each for the shape of the yield curve.

B is correct because both of the statements reflect a view that there are systematic factors other than expectations of future interest rates that affect forward rates. Garcia's statement indicates that a part of the curve has been enriched by the need of a group of investors to hedge liabilities and thus accept a negative risk premium in their "preferred habitat." Alonso's statement suggests investors will hold longer-term maturities if they are offered a long-term rate higher than the average of expected future rates by a "liquidity" (or risk) premium that is positively related to the term to maturity. According to the pure expectations theory, forward rates exclusively represent expected future spot rates; this view is not the primary theory reflected in either of their statements.

14. In comparing the analysis of corporate bonds to the analysis of fixed income securities in other sectors, Costas is *least likely* correct with respect to:

- A. Observation 1.
- B. Observation 2.
- C. Observation 3.

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Answer = A

“General Principles of Credit Analysis,” Frank J. Fabozzi

2012 Modular Level II, Vol. 5, pp. 164–170

Study Session 14-48-j

Contrast the credit analysis required for corporate bonds to that required for 1) asset-backed securities, 2) municipal securities, and 3) sovereign debt.

A is correct because in the analysis of asset-backed securities, there are no operating or business risks such as the competitive environment or existence of control systems that are needed to assess the cash flow.

15. The prepayment estimate of the mortgage pool Alonso describes is *closest* to a PSA of:

- A. 85%.
- B. 128%.
- C. 131%.

Answer = B

“Mortgage-Backed Sector of the Bond Market,” Frank J. Fabozzi

2012 Modular Level II, Vol. 5, pp. 336–339

Study Session 15-51-d

Compare the conditional prepayment rate (CPR) with the Public Securities Association (PSA) prepayment benchmark.

B is correct because the single-month mortality rate of 0.4353% equates to a conditional prepayment rate of 5.10%: $CPR = 1 - (1 - SMM)^{12} = 1 - (1 - 0.004353)^{12} = 5.10\%$. In the

PSA standard, for pools seasoned less than 30 months, $CPR = \frac{months}{30} \times PSA\% \times 6.00\%$,

which implies that $PSA\% = \frac{CPR}{\frac{months}{30} \times 6.00\%} = \frac{5.10\%}{\frac{20}{30} \times 6.00\%} = 1.275 = 128\%$.

16. Using the data in Exhibit 1, the current value of the callable bond Costas is analyzing is *closest* to:

- A. 101.40.
- B. 104.61.
- C. 105.56.

Answer = B

“Valuing Bonds with Embedded Options,” Frank J. Fabozzi

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Calculate the value of a callable bond from an interest rate tree.

B is correct because the prices are calculated from the tree by replacing any resulting price above 101.50 by 101.50 before calculating the next node. The resulting calculation is provided in the tree below. Table 1 shows original values, and Table 2 replaces 101.5 when the calculated value exceeds the call price.

Table 1

| | | |
|-------------|--------------|-------------|
| | | 99.765 (a) |
| | 101.7049 (d) | |
| 105.564 (f) | | 100.806 (b) |
| | 103.257 (e) | |
| | | 101.675 (c) |

Table 2

| | | |
|------------|-------------|-------------|
| | | 99.765 (a) |
| | 101.500 (d) | |
| 104.61 (f) | | 100.806 (b) |
| | 101.500 (e) | |
| | | 101.500 (c) |

The calculations are as follows:

$$\begin{aligned}
 &\frac{106.25}{1.065} = 99.765 ; (b) \frac{106.25}{1.054} = 100.806 ; (c) \frac{106.25}{1.0450} = 101.675 = 101.50 ; \\
 &\frac{99.765 + 6.25}{1.0475} + \frac{100.806 + 6.25}{1.0475} = \frac{203.41}{2} = 101.7049 = 101.50 ; (e) \\
 &(d) \frac{100.806 + 6.25}{1.041} + \frac{101.50 + 6.25}{1.041} = \frac{203}{2} = 101.50 ; \\
 &(f) \frac{101.50 + 6.25}{1.03} + \frac{101.50 + 6.25}{1.03} = \frac{209.22}{2} = 104.61
 \end{aligned}$$

17. Costas' explanation of the securitization in Exhibit 2 is *least likely* correct with respect to:

- A. interest payments and losses.
- B. losses and principal payments.
- C. interest and principal payments.

Answer = B

"Asset-Backed Sector of the Bond Market," Frank J. Fabozzi

2012 Modular Level II, Vol. 5, pp. 411–413.

Study Session 15-52-b

Explain and contrast prepayment tranching and credit tranching.

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B is correct because in a sequential-pay transaction, each bond class receives periodic interest. In this more complex structure, there is both prepayment tranching as well as credit tranching. Principal payments are applied first to the A1 class and then A2, etc. The first loss piece is the most subordinate tranche, in this case C, which absorbs all losses before the B tranche is impacted.

18. Costas is *least likely* correct with respect to the valuation measure for:

- A. Security A.
- B. Security B.
- C. Security C.

Answer = C

“Valuing Mortgage-Backed and Asset-Backed Securities,” Frank J. Fabozzi

2012 Modular Level II, Vol. 5, pp. 493–494

Study Session 15-53-i

Determine whether the nominal spread, zero-volatility spread, or option-adjusted spread should be used to evaluate a specific fixed income security.

C is correct because Treasury bonds do not have a spread. The nominal spread is commonly computed for spread products (ABS, MBS, corporate bonds) as the difference between the cash flow yield and the yield on a Treasury security.

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Hartmut Fischer Case Scenario

Hartmut Fischer, age 30, is the founder and 100% owner of start-up firm High Vision Social Network (HVSN), based in Stuttgart, Germany. He is selling HVSN to global media and consumer goods giant PSMG AG (PSMG) for cash and stock. German tax rules allows Fischer to sell the firm without any tax obligation for capital gains.

Executive Wealth Management Associates (EWMA), a national investment and financial planning firm, is advising Fischer in his wealth planning and in the negotiations with PSMG. Although HVSN's internationally held stock is publicly traded large-cap equity, Fischer is restricted from selling his stock for at least five years and will remain as director of the German division.

As the transaction is being finalized, Fischer meets with Silvia Schilz, a portfolio manager at EWMA, to discuss his investment needs. He shares the following information with her:

"My income as director at PSMG will be more than enough to cover all of my living expenses and save at least €100,000 annually, so I do not plan to withdraw funds from my portfolio. I would have preferred selling HVSN for cash, but by accepting the restricted stock, the total sales proceeds were almost twice as much as in a cash sale. This is the first time I've ever had any amount of wealth, and I want to be sure that it lasts a long time. The portfolio will fund our retirement. I want my portfolio to show steady growth, averaging 7% to 9% annually, with moderate volatility. A list of my assets is shown in Exhibit 1:"

Exhibit 1
Fischer Family Assets

| Assets | Value |
|--------------------------------------|-------------|
| Personal home | €1,450,000 |
| PSMG restricted stock from HVSN sale | €14,000,000 |
| Cash from HVSN sale | €6,250,000 |

Schilz arranges a future meeting with Fischer to present specific recommendations and drafts an investment policy statement (IPS) with the following elements:

- 1) A 7% to 9% return objective
- 2) A 9% standard deviation risk objective
- 3) An appropriate time horizon that recognizes his objectives and constraints
- 4) No anticipated liquidity needs

EWMA uses proprietary diversified funds of funds (FOF) for each asset class. The funds can only be liquidated monthly. Individual stocks are typically only held pursuant to a client's direction. She narrows her choice of funds to the three funds, which are presented in Exhibit 2 along with EWMA's capital market assumptions:

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Exhibit 2
Capital Market Assumptions

| | Expected Return | Standard Deviation | Beta | Sharpe Ratio | Correlation with PSMG |
|-----------------------------|-----------------|--------------------|------|--------------|-----------------------|
| PSMG stock | 12% | 20% | 1.2 | 0.50 | 1.00 |
| Large-Cap Equity Index Fund | 12% | 15% | 1.0 | 0.67 | 0.90 |
| EWMA Aggressive FOF | 15% | 13% | 0.9 | 1.00 | 0.75 |
| EWMA Alternative FOF | 12% | 15% | 0.1 | 0.67 | 0.00 |
| EWMA Short Assets FOF | 9% | 12% | -0.4 | 0.58 | -0.75 |
| Risk-free rate | 2% | | | | |

Finally Fischer asks Schilz, “I would also be very interested in learning your opinion of PSMG as an investment, since it is such a large part of my portfolio.” Schilz responds, “According to our capital market assumptions and the capital asset pricing model (CAPM), I find that PSMG stock is undervalued.”

19. The most appropriate time horizon that Schilz should include in the investment policy statement is:

- A. Five years.
- B. A multi-stage period.
- C. A single 35-year period.

Answer = B

“The Portfolio Management Process and the Investment Policy Statement,” John L. Maginn, Donald L. Tuttle, Jerald E. Pinto, and Dennis W. McLeavey
2012 Modular Level II, Vol. 6, pp. 577–578

Study Session 18-64-f

Contrast the types of investment time horizons, determine the time horizon for a particular investor, and evaluate the effects of this time horizon on portfolio choice.

B is correct. Fischer must first consider his concentrated restricted PSMG that reduces diversification during the first five years while still addressing his long-term objectives to fund his retirement.

20. Based on the IPS and Exhibit 2, which of the following elements of Fischer’s investment policy is least likely to be satisfied?

- A. Risk tolerance
- B. Liquidity needs
- C. Return objective

Answer = A

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"The Portfolio Management Process and the Investment Policy Statement," John L. Maginn, Donald L. Tuttle, Jerald E. Pinto, and Dennis W. McLeavey
2012 Modular Level II, Vol. 6, pp. 571–577

Study Session 18-64-c

Define investment objectives and constraints, and explain and distinguish among the types of investment objectives and constraints.

A is correct. None of the investment alternatives offers a standard deviation less than 12%; which is more than Schilz's recommendation of a 9% standard deviation risk objective.

21. Based on the data in Exhibit 2, which of the following would Schilz least likely include in her initial asset allocation recommendation?

- A. EWMA Aggressive FOF
- B. EWMA Alternative FOF
- C. Large-Cap Equity Index Fund

Answer = C

"Portfolio Concepts," Richard A. DeFusco, Dennis W. McLeavey, Jerald E. Pinto, and David E. Runkle

2012 Modular Level II, Vol. 6, pp. 378–379

Study Session 18-60-c

Explain the benefits of diversification and how the correlation in a two-asset portfolio and the number of assets in a multi-asset portfolio affect the diversification benefits.

C is correct because PSMG stock has a high correlation with the large-cap index and would offer little diversification benefit.

22. Based on the Sharpe ratio, which single EWMA FOF should be added to the PSMG stock holding in order to achieve the greatest mean-variance improvement for the resulting two-asset portfolio?

- A. Aggressive
- B. Alternative
- C. Short Assets

Answer = C

"Portfolio Concepts," Richard A. DeFusco, Dennis W. McLeavey, Jerald E. Pinto, and David E. Runkle

2012 Modular Level II, Vol. 6, pp. 409–410

Study Session 18-60-c

Explain the benefits of diversification and how the correlation in a two-asset portfolio and the number of assets in a multi-asset portfolio affect the diversification benefits.

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C is correct, because the addition of a new asset to a portfolio is optimal if the Sharpe ratio of the new investment is larger than the product of the Sharpe ratio of the existing portfolio and the correlation of the new investment's returns with the returns of the current portfolio.

$$\frac{E(R_{new}) - R_F}{\sigma_{new}} > \left(\frac{E(R_p) - R_F}{\sigma_p} \right) \text{Corr}(R_{new}R_p)$$

The product of the Sharpe ratio of PSMG and the correlation between PSMG and Short Assets FOF is -0.375. The difference between this and the Sharpe ratio of the Short Assets FOF is greatest at 0.958.

23. If Fischer invests his available cash of €6,250,000 in the EWMA Short Assets FOF, the standard deviation of the two-asset portfolio is closest to:

- A. 11.3%.
- B. 14.3 %.
- C. 17.5%.

Answer = A

"Portfolio Concepts," Richard A. DeFusco, Dennis W. McLeavey, Jerald E. Pinto, and David E. Runkle

2012 Modular Level II, Vol. 6, pp. 378–379

Study Session 18-60-a

Explain mean-variance analysis and its assumptions, and calculate the expected return and the standard deviation of return for a portfolio of two or three assets.

A is correct. The standard deviation of the portfolio by using his available funds from cash to purchase €6,250,000 of the EWM Short Assets Fund is approximately 11.3%. Using the formula to calculate standard deviation of a combination of two assets,

$$\sigma_P^2 = w_1^2 \sigma_1^2 + w_2^2 \sigma_2^2 + 2w_1w_2\rho_{1+2}\sigma_1\sigma_2$$

where:

the weighting of the FOF is 0.309

the weighting of PSMG is 0.691

$$(0.309^2 \times 0.12^2) + (0.691^2 \times 0.2^2) + (2 \times 0.309 \times 0.691 \times -0.75 \times 0.2 \times 0.12) = 0.113$$

$$(.309^2 \times .12^2) + (.691^2 \times .2^2) + (2 \times .309 \times .691 \times -.75 \times .2 \times .12) = .113$$

24. According to the CAPM, is Schilz's assessment of PSMG's valuation most likely correct?

- A. Yes.
- B. No, because PSMG is overvalued.
- C. No, because PSMG is fairly valued.

Answer = C

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“Portfolio Concepts,” by Richard A. DeFusco, Dennis W. McLeavey, Jerald E. Pinto, and David E. Runkle

2012 Modular Level II, Vol. 6, pp. 406–407

Study Session 18-60-f

Explain the security market line (SML), the beta coefficient, the market risk premium, and the Sharpe ratio, and calculate the value of one of these variables given values of the remaining variables.

C is correct. Exhibit 2 contains the inputs of the CAPM, and the expected return for PSMG is the same as indicated by the model:

$$E(R_i) = R_F + \beta_i[E(R_m) - R_F]$$

where

$E(R_i)$ = the expected return on asset i (PSMG)

R_F = the risk-free rate of return (2%)

$E(R_M)$ = the expected return on the market portfolio (global large cap equities, 12%)

β_i = beta of asset i , 1.1

According to the CAPM, the expected return of PSMG = $2\% + 1.2(12\% - 2\%)$, or 12%. Because the expected return is also 12%, the stock is fairly valued.

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Shoshone Capital Case Scenario

Shoshone Capital is a private equity firm that structures funds as limited partnerships for which it serves as the general partner. The funds focus on buyouts of publicly traded companies. Shoshone has produced a new marketing brochure that it will use to solicit capital investments. The first section of the brochure describes the common characteristics of buyout investments, including:

- Characteristic 1: The target firms generally have experienced management teams.
- Characteristic 2: There is often potential for substantial cost reductions in target firms.
- Characteristic 3: The deals are generally arranged through relationships with the existing shareholders.

Section 2 of the brochure discusses how Shoshone aligns its interests with those of the managers of its portfolio companies.

Shoshone's brochure provides an example of a typical acquisition, in which it purchases LUW, Inc. for \$160 million. After the acquisition, LUW's new capital structure consists of \$80 million in debt, \$65 million in preference shares, and \$15 million in common equity. After six years, Shoshone sells LUW, Inc. to another private equity firm for \$285 million.

The brochure also provides an example of a private equity fund called Tensleep Fund, which has committed capital of \$150 million, a management fee of 2%, carried interest of 20%, and a hurdle rate of 9%. Carried interest is paid on a deal-by-deal basis. In the example, the fund calls \$100 million in commitments at the beginning of the first year and invests \$40 million in Firm A and \$60 million in Firm B. At the beginning of the second year, it calls the remaining \$50 million and invests it in Firm C. At the end of the second year, the investment in Firm B is sold for \$70 million. At the end of the third year, the fund's investment in Firm A is worth \$54 million, its investment in Firm C is worth \$40 million, and it has \$46 million in cash.

The brochure concludes with the history of a second private equity fund called Pocatello Fund. The first five years of this fund's cash flows and distributions are presented in Exhibit 1.

Exhibit 1 Pocatello Fund

Cash Flows and Distributions (USD million)

| Year | Paid-In Capital | Mgmt Fees | Operating Results | NAV before Distributions | Carried Interest | Distributions | NAV after Distributions |
|------|-----------------|-----------|-------------------|--------------------------|------------------|---------------|-------------------------|
| 2005 | 40 | 0.8 | -3 | 36.2 | | | 36.2 |
| 2006 | 55 | 1.1 | 4 | 54.1 | | | 54.1 |
| 2007 | 80 | 1.6 | 11 | 88.5 | | | 88.5 |
| 2008 | 100 | 2.0 | 27 | 133.5 | 4.2 | 19 | 110.3 |
| 2009 | 125 | 2.0 | 34 | 167.3 | 6.6 | 38 | 122.7 |

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25. Which of the characteristics listed in the brochure regarding buyout investments is least likely correct?

- A. Characteristic 1
- B. Characteristic 2
- C. Characteristic 3

Answer = C

“Private Equity Valuation,” Yves Courtois and Tim Jenkinson

2012 Modular Level II, Vol. 5, pp. 56–57

Study Session 13-46-c

Distinguish between the characteristics of buyout and venture capital investments.

C is correct because it describes venture capital investments, which are commonly the result of relationships between venture capitalists and entrepreneurs (existing shareholders or owners). Most buyout transactions are auctions, involving multiple potential acquirers.

26. Which of these clauses is most likely to be included in Section 2 of Shoshone’s brochure?

- A. Reserved matters
- B. Liquidation preference
- C. Tag-along, drag-along rights

Answer = C

“Private Equity Valuation,” Yves Courtois and Tim Jenkinson

2012 Modular Level II, Vol. 5, p. 54

Study Session 13-46-b

Explain how private equity firms align their interests with those of the managers of portfolio companies.

C is correct because tag-along, drag-along rights protect the interests of managers, not the private equity firm. Tag-along, drag-along rights ensure any potential future acquirer of the company may not acquire control without extending an acquisition offer to all shareholders, including the management of the company.

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27. When LUW, Inc. is sold by Shoshone, which part of its capital structure will most likely have decreased in size?

- A. Debt
- B. Common equity
- C. Preference shares

Answer = A

“Private Equity Valuation,” Yves Courtois and Tim Jenkinson

2012 Modular Level II, Vol. 5, pp. 57–60

Study Session 13-46-d

Describe valuation issues in buyout and venture capital transactions.

A is correct because a common source of value creation in leveraged buyouts is debt reduction.

28. Compared to the exit route chosen, Shoshone’s least likely alternate exit route for the LUW, Inc. investment is a(n):

- A. liquidation.
- B. management buyout.
- C. initial public offering.

Answer = A

“Private Equity Valuation,” Yves Courtois and Tim Jenkinson

2012 Modular Level II, Vol. 5, pp. 61–63

Study Session 13-46-e

Explain alternative exit routes in private equity and their impact on value.

A is correct because liquidation is the route chosen if the company is no longer viable. The exit route used for LUW, Inc. is a secondary market transaction, at a price that indicates a strong company.

29. The carried interest paid to the general partner of the Tensleep Fund at the end of the second year is closest to:

- A. \$0.
- B. \$0.7 million.
- C. \$2.0 million.

Answer = A

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“Private Equity Valuation,” Yves Courtois and Tim Jenkinson

2012 Modular Level II, Vol. 5, pp. 65–68, 74–77

Study Session 13-46-f, i

Explain private equity fund structures, terms, valuation, and due diligence in the context of an analysis of private equity fund returns.

Calculate management fees, carried interest, net asset value, distributed to paid in (DPI), residual value to paid in (RVPI), and total value to paid in (TVPI) of a private equity fund.

A is correct because although the investment in Firm B produced a \$10 million profit in two years, that figure represents an annual return (IRR) of only $8.01\% = (70 \text{ million}/60 \text{ million})^{1/2} - 1$, which is below the hurdle rate. The general partner will not receive any carried interest payments until the fund’s internal rate of return exceeds the hurdle rate.

30. In 2009, the total value to paid in (TVPI) of the Pocatello Fund is closest to:

- A. 0.46×
- B. 0.98×
- C. 1.44×

Answer = C

“Private Equity Valuation,” Yves Courtois and Tim Jenkinson

2012 Modular Level II, Vol. 5, pp. 72–77

Study Session 13-46-i

Calculate management fees, carried interest, net asset value, distributed to paid in (DPI), residual value to paid in (RVPI), and total value to paid in (TVPI) of a private equity fund.

C is correct because total value to paid in (TVPI) equals distributed to paid in (DPI) plus residual value to paid in (RVPI), where DPI is the sum of distributions divided by paid-in capital $[(19 + 38)/125] = 0.46$ and RVPI is NAV after distributions divided by paid-in capital $(122.7/125) = 0.98$. $TVPI = 0.46 + 0.98 = 1.44$.

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Paul Charlent Case Scenario

Paul Charlent works for a London-based merchant bank that specializes in assisting small and medium-sized companies in developing markets to place debt and equity issues with U.S. and U.K. investors. Charlent is conducting exploratory analysis regarding possible relationships between developing market equity returns and various U.S. and U.K. macroeconomic variables. He regresses monthly total returns of the Bangkok SET Index on one-month LIBOR (for a U.S. dollar–denominated contract). The period of the study is from July 2003 through December 2010. To improve the statistical validity of the variables, for both the SET index and LIBOR, Charlent uses the natural logarithms of one plus the monthly returns in the regression calculation. The results of the regression are shown in Exhibit 1 and Exhibit 2.

| Exhibit 1 | |
|---|--------|
| Regression of SET Index on LIBOR | |
| $\ln(1 + SET) = \alpha + \beta \times \ln(1 + LIBOR) + \varepsilon$ | |
| $\ln(1 + SET) = \alpha + \beta \times \ln(1 + LIBOR) + \varepsilon$ | |
| Summary Output | |
| Regression Statistics | |
| Multiple R | 0.1623 |
| R^2 | 0.0263 |
| Adjusted R^2 | 0.0152 |
| Standard error | 0.0729 |
| Observations | 89 |

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| Exhibit 2 | | | | | | | |
|---|--------------|---------|----------------|-------------|----------------|-----------|-----------|
| Regression of SET Index on LIBOR | | | | | | | |
| $\ln(1 + SET) = \alpha + \beta \times \ln(1 + LIBOR) + \varepsilon$ | | | | | | | |
| $\ln(1 + SET) = \alpha + \beta \times \ln(1 + LIBOR) + \varepsilon$ | | | | | | | |
| ANOVA | | | | | | | |
| | df | SS | MS | F | Significance F | | |
| Regression | 1 | 0.0125 | 0.0125 | 2.355 | 0.1285 | | |
| Residual | 87 | 0.4624 | 0.0053 | | | | |
| Total | 88 | 4499.91 | | | | | |
| | Coefficients | | Standard Error | t-Statistic | p-Value | Lower 95% | Upper 95% |
| Intercept | 0.031 | | 0.015 | 1.997 | 0.0489 | 0.010 | 0.061 |
| LIBOR | −0.732 | | 0.477 | −1.535 | 0.1285 | −1.679 | 0.216 |

Charlent suspects that his regression equation might not be well specified. In particular, he is concerned with the possibility that one or both of the time series in the regression exhibit a unit root. Using the Engle–Granger approach, he tests the residuals from the above regression and rejects the null hypothesis that the error term has a unit root.

Charlent next regresses the natural logarithm of one plus the SET Index monthly returns on the natural logarithm of one plus LIBOR, the natural logarithm of one plus the effective Fed funds rate, and the USD/GBP exchange rate. The results are reported in Exhibit 3 and Exhibit 4. Charlent recalls that the null hypothesis of no positive serial correlation is rejected if the calculated DW statistic is less than the lower critical value and that the null hypothesis of no negative serial correlation is rejected if the calculated DW statistic exceeds 4 minus the lower critical value.

Exhibit 5 reports the pairwise correlations of the variables used in the second regression.

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| Exhibit 3 | | | | | | | | | | | | | | | | | | | |
|---|--------|-----------------------|--|------------|--------|-------|--------|----------------|--------|----------------|--------|------------------------------|--------|-------------------------|------|-------------------------|------|--------------|----|
| <p>Regression of SET Index on LIBOR, Fed Funds, and USD/GBP</p> $\ln(1 + SET) = \alpha + \beta_1 \times \ln(1 + LIBOR) + \beta_2 \times \ln(1 + Fed Funds) + \beta_3 \times \$ / \pounds + \varepsilon$ $\ln(1 + SET) = \alpha + \beta_1 \times \ln(1 + LIBOR) + \varepsilon$ | | | | | | | | | | | | | | | | | | | |
| <p>Summary Output</p> <table> <tr> <th colspan="2">Regression Statistics</th></tr> <tr> <td>Multiple R</td><td>0.5544</td></tr> <tr> <td>R^2</td><td>0.3073</td></tr> <tr> <td>Adjusted R^2</td><td>0.2829</td></tr> <tr> <td>Standard error</td><td>0.0622</td></tr> <tr> <td>Durbin Watson (DW) statistic</td><td>1.9566</td></tr> <tr> <td>DW upper critical value</td><td>1.73</td></tr> <tr> <td>DW lower critical value</td><td>1.59</td></tr> <tr> <td>Observations</td><td>89</td></tr> </table> | | Regression Statistics | | Multiple R | 0.5544 | R^2 | 0.3073 | Adjusted R^2 | 0.2829 | Standard error | 0.0622 | Durbin Watson (DW) statistic | 1.9566 | DW upper critical value | 1.73 | DW lower critical value | 1.59 | Observations | 89 |
| Regression Statistics | | | | | | | | | | | | | | | | | | | |
| Multiple R | 0.5544 | | | | | | | | | | | | | | | | | | |
| R^2 | 0.3073 | | | | | | | | | | | | | | | | | | |
| Adjusted R^2 | 0.2829 | | | | | | | | | | | | | | | | | | |
| Standard error | 0.0622 | | | | | | | | | | | | | | | | | | |
| Durbin Watson (DW) statistic | 1.9566 | | | | | | | | | | | | | | | | | | |
| DW upper critical value | 1.73 | | | | | | | | | | | | | | | | | | |
| DW lower critical value | 1.59 | | | | | | | | | | | | | | | | | | |
| Observations | 89 | | | | | | | | | | | | | | | | | | |

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| Exhibit 4 | | | | | | |
|---|--------------|----------------|-------------|-----------------------|----------------------|-----------|
| Regression of SET Index on LIBOR, Fed funds, and USD/GBP | | | | | | |
| $\ln(1 + SET) = \alpha + \beta_1 \times \ln(1 + LIBOR) + \beta_2 \times \ln(1 + Fed Funds) + \beta_3 \times \$ / \pounds + \varepsilon$ $\ln(1 + SET) = \alpha + \beta_1 \times \ln(1 + LIBOR) + \beta_2 \times \ln(1 + Fed Funds) + \beta_3 \times \$ / \pounds + \varepsilon$ | | | | | | |
| ANOVA | | | | | | |
| | df | SS | MS | F | Significance F | |
| Regression | 3 | 0.1460 | 0.0486 | 12.572 | 7.03E ⁻⁰⁷ | |
| Residual | 85 | 0.3289 | 0.0039 | | | |
| Total | 88 | 0.4749 | | | | |
| | Coefficients | Standard Error | t-Statistic | p-Value | Lower 95% | Upper 95% |
| Intercept | 0.152 | 0.077 | 1.977 | 0.0512 | -0.001 | 0.304 |
| LIBOR | -11.199 | 1.966 | -5.697 | 1.711E ⁻⁰⁷ | -15.107 | -7.291 |
| Fed funds | 11.070 | 1.920 | 5.765 | 1.284E ⁻⁰⁷ | 7.252 | 14.888 |
| USD/GBP | -0.063 | 0.048 | -1.293 | 0.199 | -0.159 | 0.034 |

| Exhibit 5 Pairwise Correlations | | | |
|------------------------------------|--------|-----------|---------|
| Variable | LIBOR | Fed Funds | USD/GBP |
| LIBOR | 1.0000 | | |
| Fed funds | 0.9814 | 1.0000 | |
| USD/GBP | 0.6872 | 0.6798 | 1.0000 |

Geoffrey Small, a colleague of Charlent, comments on the results of the two regressions. Small states that the highly significant *F*-statistic of the second regression along with the increased *R*² of the second regression means that the addition of the Fed funds rate and the USD/GBP exchange rate to the analysis provides more reliable estimates of linear associations than the first regression.

31. Based on the results in Exhibits 1 and 2, the *most* appropriate interpretation is that:

- A. there is a small but positive correlation between the SET Index and LIBOR.
- B. the variation in LIBOR does not explain the variation in SET index returns.
- C. LIBOR has a statistically significant linear relationship with returns of the SET Index.

Answer = B

“Correlation and Regression,” Richard A. DeFusco, Dennis W. McLeavey, Jerald E. Pinto, and David E. Runkle

2012 Modular Level II, Vol. 1, pp. 308–310, 320

Study Session 3-11-e, f

Explain the assumptions underlying linear regression and interpret the regression coefficients. Calculate and interpret the standard error estimate, the coefficient of determination, and a confidence interval for a regression coefficient.

B is correct. The coefficient of determination (R^2) is 0.0263. Such a low R^2 indicates that the regression has little explanatory power—that is, less than 3% of the variation in the SET Index is explained by the variation in LIBOR. The insignificance of the F -test in Exhibit 2 confirms this lack of explanatory power. The slope coefficient is not significant (p -value = 0.1285), again confirming that this regression has little explanatory power.

32. Using Exhibit 2 and two-tail t -tests to determine if the coefficients are equal to zero, at the 0.05 significance level, the null hypotheses are most likely:

- A. rejected for both the intercept and the slope.
- B. accepted for the intercept and rejected for the slope.
- C. rejected for the intercept and accepted for the slope.

Answer = C

“Correlation and Regression,” Richard A. DeFusco, Dennis W. McLeavey, Jerald E. Pinto, and David E. Runkle

2012 Modular Level II, Vol. 1, pp. 310–314

Study Session 3-11-e, f, g

Explain the assumptions underlying linear regression and interpret the regression coefficients. Calculate and interpret the standard error estimate, the coefficient of determination, and a confidence interval for a regression coefficient.

Formulate a null and alternative hypothesis about a population value of a regression coefficient, select the appropriate test statistic, and determine whether the null hypothesis is rejected at a given level of significance.

C is correct. The intercept coefficient of the regression line is 0.031. The p -value indicates that the probability of having a sample result of 0.031 when the underlying population coefficient is zero is about 4.89%. As this p -value is less than 5%, we reject the null hypothesis for the intercept. The slope coefficient is -0.732 . The p -value indicates that the probability of having a sample result of -0.732 when the underlying population coefficient is zero is about 12.85%. As

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the p -value exceeds the 5% level of significance, we fail to reject the null hypothesis for the slope coefficient. Note that you can also answer the question by examining the reported confidence intervals. The 95% confidence interval for the intercept does not contain zero (we reject the null). The 95% confidence interval for the slope does contain zero (we accept the null).

33. Using the regression equation results reported in Exhibit 2, if the value for LIBOR is 3%, and thus the $\ln(1 + 0.03)$ is 0.02956, the point estimate of the associated return on the SET Index is closest to:

- A. -2.16%.
- B. 0.90%.
- C. 0.94%.

Answer = C

“Correlation and Regression,” Richard A. DeFusco, Dennis W. McLeavey, Jerald E. Pinto, and David E. Runkle

2012 Modular Level II, Vol. 1, pp. 322–324

Study Session 3-11-h

Calculate a predicted value for the dependent variable, given an estimated regression model and a value for the independent variable, and calculate and interpret a confidence interval for the predicted value of a dependent variable.

C is correct. The regression equation is $\ln(1 + \text{SET Index return}) = 0.031 - 0.732 \times \ln(1 + \text{LIBOR})$.

If LIBOR is 3%, then $\ln(1 + \text{SET Index return}) =$

$$0.031 - 0.732 \times 0.02956 = 0.00936.$$

Continuing, $\exp[\ln(1 + \text{SET Index return})] = \exp(0.00936)$ and, therefore,

$1 + \text{SET Index return} = 1.00941$. The estimate of the SET Index return is 0.941%.

34. The most appropriate conclusion that follows from the result of the Engle–Granger test is that the two time series are:

- A. cointegrated, and tests of the estimates of the intercept and slope are therefore valid.
- B. cointegrated, and tests of the estimates of the intercept and slope are therefore not valid.
- C. not cointegrated, and tests of the estimates of the intercept and slope are therefore valid.

Answer = A

“Time-Series Analysis,” Richard A. DeFusco, Dennis W. McLeavey, Jerald E. Pinto, and David E. Runkle

2012 Modular Level II, Vol. 1, pp. 488–489

Study Session 3-13-n

Explain how time series variables should be analyzed for nonstationarity and/or cointegration before use in a linear regression.

A is correct. Based on Statement 4 on page 489:

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If the (Engle–Granger) Dickey–Fuller test rejects the null hypothesis that the error term has a unit root, as Charlent’s test did, then we conclude that the error term in the regression is covariance stationary. Therefore, the two time series are cointegrated (i.e., the two series share a common trend). The parameters and standard errors from linear regression will be consistent and will let us test hypotheses about the long-term relation between the two series.

35. Based on Exhibit 3 and Exhibit 4 and the reported Durbin Watson statistic, the most appropriate conclusion is:

- A. serial correlation is not significant, and the standard errors are unbiased.
- B. significant serial correlation is present, and the standard errors are likely to be overestimated.
- C. significant serial correlation is present, and the standard errors are likely to be underestimated.

Answer = A

“Multiple Regression and Issues in Regression Analysis,” Richard A. DeFusco, Dennis W. McLeavey, Jerald E. Pinto, and David E. Runkle
2012 Modular Level II, Vol. 1, pp. 379–381
Study Session 3-12-i

Explain the types of heteroskedasticity and the effects of heteroskedasticity and serial correlation on statistical inference.

A is correct. The value of the Durbin Watson statistic exceeds the upper critical value ($1.9566 > 1.73$). We fail to reject the null hypothesis of no positive serial correlation. The value of the DW statistic is less than the value ($4 - 1.59$) = 2.41. Thus, we also fail to reject the null hypothesis regarding negative serial correlation (see footnote 49, page 381 of the reading).

36. Regarding Geoffrey Small’s statement about the second regression, which of the following is least accurate?

- A. The F -statistic of the second regression is likely overestimated.
- B. Small is incorrect because the second regression displays multicollinearity.
- C. The second regression is an improvement, as both LIBOR and Fed funds show significant relationships to SET.

Answer = C

“Multiple Regression and Issues in Regression Analysis,” Richard A. DeFusco, Dennis W. McLeavey, Jerald E. Pinto, and David E. Runkle
2012 Modular Level II, Vol. 1, pp. 382–385
Study Session 3-12-j

Describe multicollinearity and explain its causes and effects in regression analysis.

C is correct. The high pairwise correlations of Exhibit 5, especially the correlation between LIBOR and Fed funds, suggest a multicollinearity problem. In the presence of multicollinearity, R^2 values and F -statistics are overstated and estimates of the coefficients become extremely imprecise and unreliable.

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Aeolus Controls AG Case Scenario

Karen Spaulding is the chief equity analyst at Shearson Woods. She was asked by Jim Tomlinson, the firm's chief investment officer, to carry out an analysis of the common shares of Aeolus Controls AG, a company that prepares its financial statements using IFRS.

Aeolus Controls produces a broad range of heating, cooling, and refrigeration products for global use. Its three major operating segments are home comfort products, industrial and building products, and transportation refrigeration units. Selected financial statement information for Aeolus is presented in Exhibits 1 and 2.

| Exhibit 1 Aeolus Controls, AG Selected Financial Data as at December 31 (in € Millions) | | |
|--|-------------|-------------|
| | 2010 | 2009 |
| Operating cash flow | 2,449 | 3,229 |
| Operating income | 6,986 | 2,694 |
| | | |
| Sales | 19,750 | 19,371 |
| Interest expense | 152 | 143 |
| Operating lease payments | 126 | 113 |
| | | |
| Cash interest paid | 81 | 84 |
| Cash taxes paid | 532 | 496 |
| | | |
| Total assets | 20,097 | 19,964 |
| Capital expenditures | 824 | 835 |
| Expenditures on intangible assets | 73 | 72 |
| | | |
| Current debt | 2,271 | 2,599 |
| Long-term debt | 1,347 | 1,614 |
| | | |
| Total shareholder's equity | 11,268 | 9,654 |

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| | | | | | | | | | |
|---|------------|---|-----|--------------------|----|--|-----|--------------------------|------------|
| <p align="center">Exhibit 2 Aeolus Controls AG Selected Notes to the Financial Statements</p> | | | | | | | | | |
| <p>Operations and Summary of Significant Accounting Policies Note 1. Revenue Recognition</p> <p>Revenue from the sale of goods is recognized in the income statement at the moment when the significant risks and rewards of ownership of the goods have been transferred to the buyer, which is mainly upon shipment. In special circumstances, at the customer's request, the company may sell products on a bill-and-hold basis provided that the product is ready for shipment. Such goods are segregated, and the risks of ownership and legal title have passed to the customer. This practice is limited only to customers who are government agencies who request it for budgetary and physical planning reasons. The amount of such bill-and-hold sales averages about 3% of consolidated sales annually.</p> | | | | | | | | | |
| <p>Note 7. Property, Plant, and Equipment</p> <p>Up until 31 December 2010, the company amortized its machinery and equipment on a straight-line basis over a 10-year expected useful life. As of 2011, the company's estimate of the useful life of certain machinery and equipment will be reduced to eight years.</p> | | | | | | | | | |
| <p>Note 12. Restructuring Charges</p> <p>In 2010, the company introduced an early retirement program for those employees who were 50 years of age or older who voluntarily left employment. A larger number of employees than anticipated accepted the offer, and the company recorded an expense of €10.5 million, of which €4.5 million was classified as nonrecurring.</p> | | | | | | | | | |
| <p>Note 18. Financial and Operating Leases</p> <p>A. Financial Leases The implicit interest rate on finance leases for 2009 and 2010 was 6.0%.</p> <p>B. Operating Lease Commitments (in € Millions) as of 31 December 2010</p> <table> <tr> <td>Due 1 January: 2011, 2012, 2013, and 2014</td><td align="right">130</td></tr> <tr> <td>Due 1 January 2015</td><td align="right">80</td></tr> <tr> <td>Total of future lease payments thereafter*</td><td align="right">320</td></tr> <tr> <td>Total Commitments</td><td align="right">920</td></tr> </table> <p>*After 2015, all lease payments are assumed to be the same as in 2015</p> | | Due 1 January: 2011, 2012, 2013, and 2014 | 130 | Due 1 January 2015 | 80 | Total of future lease payments thereafter* | 320 | Total Commitments | 920 |
| Due 1 January: 2011, 2012, 2013, and 2014 | 130 | | | | | | | | |
| Due 1 January 2015 | 80 | | | | | | | | |
| Total of future lease payments thereafter* | 320 | | | | | | | | |
| Total Commitments | 920 | | | | | | | | |

Spaulding tells Tomlinson that she suspects the recent increase in profitability is the result of earnings management. In support, she presents several ratios in Exhibit 3.

| |
|--|
| <p>Exhibit 3 Aeolus Controls AG Selected Accrual, Cash Flow and Profit Ratios as at December 31</p> |
|--|

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| | 2010 | 2009 |
|--|-------|-------|
| Balance sheet accruals ratio | -7.6% | 3.1% |
| Cash flow accruals ratio | 10.5% | -1.1% |
| Operating cash flow ÷ Operating income | 0.4 | 1.2 |
| Revenue ÷ Cash collected ratio | 99.8% | 98.8% |
| Net profit margin | 32.2% | 11.0% |

Tomlinson responds, "The comparison you have made between operating cash flow and operating earnings is biased upward when comparing to accrual based operating income."

Spaulding says, "Although the company could repay all of its debt and maintain reinvestment, if it chose to do so, there are off-balance-sheet issues to consider. I'm in the process of capitalizing the operating leases but so far have only calculated the adjusted long-term debt/equity ratio for 2009." It is shown in Exhibit 4.

| Exhibit 4 Aeolus Controls, AG Long-Term Debt/Equity Ratios | | |
|--|------------|--|
| | Unadjusted | After Capitalization of Operating Leases |
| 2009 | 17% | 23% |

Finally, Spaulding said that she was worried about the company's recent capital allocation decisions and earnings sustainability, as she suspects that the top-performing segments are being allocated a smaller proportion of capital expenditures than their proportion of total assets. She presents her findings in Exhibit 5.

| Exhibit 5 Aeolus Controls, AG Segments Data | | | | | | |
|---|-------------|------|---------------------------------------|------|-------------------------------------|------|
| | EBIT Margin | | Segment Assets as a % of Total Assets | | Segment Capex as a % of Total Capex | |
| | 2010 | 2009 | 2010 | 2009 | 2010 | 2009 |
| Home Comfort | 13.8 | 13.6 | 7.2 | 7.2 | 29.0 | 35.9 |
| Industrial & Building | 20.5 | 20.4 | 25.7 | 29.0 | 6.4 | 4.4 |
| Transportation Refrigeration | 14.5 | 14.2 | 67.1 | 63.8 | 64.6 | 59.7 |

37. Which of the following accounting policies of the company would *most likely* lead Spaulding to be concerned about low quality earnings? The company's:

- A. revenue recognition practices.
- B. change in depreciation methods.

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C. classification of the early retirement expense.

Answer = C

“Evaluating Financial Reporting Quality,” Scott Richardson and Irem Tuna

2012 Modular Level II, Vol. 2, pp. 380–382, 390–96

Study Session 7-26-d, f

Describe earnings quality and measures of earnings quality, and compare the earnings quality of peer companies.

Explain potential problems that affect the quality of financial reporting, including revenue recognition, expense recognition, balance sheet issues, and cash flow statement issues, and interpret warning signs of these potential problems.

C is correct. Once available, early retirement programs are a normal business operation and the entire amount should be classified as an operating expense. The bill-and-hold approach is appropriate here given that it is at the request of the customer (and the earnings process is virtually complete).

38. Based on Exhibit 3, which of the following statements is most appropriate?

- A. The company experienced more cash earnings than accounting earnings in 2010.
- B. Tomlinson’s comment about the bias in the cash flow to operating income ratio is correct.
- C. The company’s earnings quality has improved in 2010 according to the cash-flow-based accruals ratio.

Answer = A

“Evaluating Financial Reporting Quality,” Scott Richardson and Irem Tuna

2012 Modular Level II, Vol. 2, pp. 365–369

“Integration of Financial Statement Analysis Techniques,” Jack T. Ciesielski, Jr.

2012 Modular Level II, Vol. 2, pp. 437–443

Study Session 7-26-d; 7-27-c

Describe earnings quality and measures of earnings quality, and compare the earnings quality of peer companies.

Evaluate the quality of a company’s financial data and recommend appropriate adjustments to improve quality and comparability with similar companies, including adjustments for differences in accounting rules, methods, and assumptions.

A is correct. A negative balance sheet accruals ratio indicates that cash earnings exceeded accounting earnings.

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39. Using 2010 data, if the company wished to pay off all of its debt while maintaining its current reinvestment policy, the number of years it would take to do so is closest to:

- A. 1.5.
- B. 1.7.
- C. 2.3.

Answer = C

“Integration of Financial Statement Analysis Techniques,” Jack T. Ciesielski, Jr.
2012 Modular Level II, Vol. 2, pp. 442–443

Study Session 7-27-c, d, e

Evaluate the quality of a company’s financial data and recommend appropriate adjustments to improve quality and comparability with similar companies, including adjustments for differences in accounting rules, methods, and assumptions.

Evaluate the effect on financial statements and ratios of a given change in accounting rules, methods, or assumptions.

Analyze and interpret the effects of balance sheet modifications, earnings normalization, and cash flow statement–related modifications on a company’s financial statements, financial ratios, and overall financial condition.

C is correct.

| $\text{Years to repay debt from operating cash flow} = \frac{\text{Total debt}}{\text{Operating cash flow} - \text{reinvestment}}$ | | |
|--|---------------|-------------|
| Total debt = Current debt + Long term debt | 2,271 + 1,347 | €3,618 |
| Reinvestment = Capital expenditures + Expenditures on intangibles | 824 + 73 | €897 |
| Operating cash flow – Reinvestment | 2,449 – 897 | €1,552/year |
| $\text{Years to repay debt from operating cash flow} = \frac{3,618}{1,552} = \mathbf{2.3 \text{ years}}$ | | |

40. Using the lease information in Exhibits 1 and 2, the company’s adjusted long-term debt/assets ratio as of the end of December, 2010 is *closest* to:

- A. 10.1%.
- B. 10.5%.
- C. 10.8%.

Answer = A

“Long-Lived Assets: Implications for Financial Statements and Ratios,” Elaine Henry and Elizabeth A. Gordon
2012 Modular Level II, Vol. 2 pp. 96–100

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“Integration of Financial Statement Analysis Techniques,” Jack T. Ciesielski, Jr.

2012 Modular Level II, Vol. 2, pp. 449–451

Study Session 7-21-e; 7-27-c, d, e

Explain and evaluate the effects on financial statements and ratios of leasing assets instead of purchasing assets.

Evaluate the quality of a company’s financial data and recommend appropriate adjustments to improve quality and comparability with similar companies, including adjustments for differences in accounting rules, methods, and assumptions.

Evaluate the effect on financial statements and ratios of a given change in accounting rules, methods, or assumptions.

Analyze and interpret the effects of balance sheet modifications, earnings normalization, and cash flow statement–related modifications on a company’s financial statements, financial ratio, and overall financial condition.

A is correct.

| Present Value of Operating Lease Payments | | | |
|---|---|----------------------|----------------------|
| The lease commitments after 2015 are assumed to be the same as in 2015, meaning that there is estimated to be $320 \div 80 = 4$ additional payments. | | | |
| The present value of the operating lease payments can be calculated as the sum of the present values of two annuities-in-advance: a four-year annuity starting immediately (2011), and a five-year annuity starting in four years (2015). | | | |
| Years | Cash Flow × Annuity-in-Advance Factor | Discount by | Present Value |
| 2011 to 2014 | $130 \times PVA^{ADV} (4 \text{ years}, 6\%) = 477.5$ | $\frac{1}{(1.06)^0}$ | 477.5 |
| 2015 & beyond | $80 \times PVA^{ADV} (5 \text{ years}, 6\%) = 357.2$ | $\frac{1}{(1.06)^4}$ | <u>282.9</u> |
| | | Total | 760.4 |
| PVA^{ADV} (4 years, 6%) by Financial Calculator: N = 4; I = 6; PMT = 1; Mode = BGN; Compute PV | | | |
| Adjusted Long-Term Debt/Asset Ratio Calculation | | | |
| Adjusted long-term debt | $1,347 + 760 =$ | 2,107 | |
| Adjusted total assets | $20,097 + 760 =$ | 20,857 | |
| Adjusted long-term debt/asset ratio | $2,107 \div 20,857 =$ | 10.1% | |

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| Alternatively, the individual cash flows can be separately discounted | | | |
|--|---|---|--------------|
| Present Value of Operating Lease Payments | | | |
| Year | Cash Flow | Cash flow \times PV Factor | PV |
| 0 | 130 | $130 \times PV(0y, 6.0\%)$ | 130.0 |
| 1 | 130 | $130 \times PV(1y, 6.0\%)$ | 122.6 |
| 2 | 130 | $130 \times PV(2y, 6.0\%)$ | 80.1 |
| 3 | 130 | $130 \times PV(3y, 6.0\%)$ | 67.2 |
| 4 | 80 | $80 \times PV(4y, 6.0\%)$ | 39.6 |
| Beyond 4 | $320 \div \$80/\text{yr} = 4 \text{ years}$ | $80 \times PVA(4y, 6.0\%) \times PV(4y, 6.0\%)$ | <u>219.6</u> |
| | | Total | 760.4 |
| PVA (4 years, 6%) by Financial Calculator: N = 4; I = 6; PMT = 1; Mode = END; Compute PV | | | |

41. The interest coverage ratio for 2009 after capitalizing the operating leases is *closest* to:

- A. 14.7.
- B. 15.3.
- C. 19.2.

Answer = B

“Integration of Financial Statement Analysis Techniques,” Jack T. Ciesielski, Jr.

2012 Modular Level II, Vol. 2, pp. 448–451

Study Session 7-27-c, d, e

Evaluate the quality of a company’s financial data and recommend appropriate adjustments to improve quality and comparability with similar companies, including adjustments for differences in accounting rules, methods, and assumptions.

Evaluate the effect on financial statements and ratios of a given change in accounting rules, methods, or assumptions.

Analyze and interpret the effects of balance sheet modifications, earnings normalization, and cash flow statement–related modifications on a company’s financial statements, financial ratio, and overall financial condition.

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B is correct.

| | | |
|--|-------------|-------------------------------|
| The interest coverage ratio would be Revised EBIT ÷ Revised interest expense. If the operating leases had been capitalized, the EBIT would exclude lease payments but include depreciation expense on the capitalized leases. The interest expense would include interest on the capitalized lease debt. | | |
| Step 1: Determine the amount of leases that were capitalized by using the adjusted long-term debt/equity ratio in Exhibit 4. | | |
| The long-term debt/equity ratio adjusted for operating leases in 2009 was 0.23 (Exhibit 4). | | |
| The adjusted amount of debt was: $0.23 = \frac{\text{Adjusted Debt}}{9,654}$. | | |
| Adjusted debt = 2,220 | | |
| Capitalized operating lease = Adjusted long-term debt – Original long-term debt = 2,220 – 1,614 = 606 | | |
| Step 2: Determine the revised EBIT. | | |
| EBIT (Operating Income, 2009) | €2,694.0 | (in millions) |
| Operating lease payments | 113.0 | |
| Estimated depreciation on newly recognized assets | (60.6) | €606 ÷ 10 years |
| Revised EBIT | 2,746.4 | |
| Step 3: Determine the revised interest expense. | | |
| Interest expense reported | 143.0 | |
| Assumed interest expense on leases | 36.4 | 6% × €606 (Note 18 Exhibit 1) |
| Adjusted interest expense | 179.4 | |
| Adjusted interest coverage ratio | 15.3 | 2,746.4 ÷ 179.4 |

42. During 2010, the company *most likely* allocated its capital expenditures on a growth basis to which operating segment?

- A. Home Comfort
- B. Industrial & Building
- C. Transportation Refrigeration

Answer = A

“Integration of Financial Statement Analysis Techniques,” Jack T. Ciesielski, Jr.

2012 Modular Level II, Vol. 2, pp. 432–437

Study Session 7-27-c

Evaluate the quality of a company’s financial data and recommend appropriate adjustments to improve quality and comparability with similar companies, including adjustments for differences in accounting rules, methods, and assumptions.

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A is correct.

The ratio of capital expenditure percentage to total asset percentage should be calculated for each segment: If greater than 1, it indicates that a segment is being allocated a greater proportion of capital expenditures than its proportion of total assets and is thus growing the segment. As determined below, the ratio exceeds 1.0 for only the Home Comfort segment.

| | Segment Assets as a % of Total Assets | Segment Capex as a % of Total Capex | Ratio |
|---|--|--|--------------|
| Home Comfort | 7.2 | 29.0 | 4.02 |
| Industrial & Building | 25.7 | 6.4 | 0.25 |
| Transportation Refrigeration | 67.1 | 64.6 | 0.96 |
| Ratio = $\frac{\% \text{ of capital expenditures}}{\% \text{ of total assets}}$ | | | |

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Peter Langer Case Scenario

Peter Langer is a credit analyst with a national credit rating agency and is preparing a credit rating for a new client, Masson Enterprises Inc (Masson). Masson operates a chain of 250 retail stores specializing in the hardware and home renovation market. The mid-sized stores are located in suburban malls in the American North West. In 2009, Masson built a large distribution center near Seattle, Washington, U.S.A. that the company uses to supply the stores with its products, many of which are made in China. In 2010, Masson made an acquisition of a small regional chain of stores, which resulted in an increase in both assets and debt.

The home renovation industry has been particularly hard hit by an economic slowdown that started in 2010. Because Masson's year-end is October 31, the slowdown only had a small impact on 2010 results, but the full effect will be reflected in the 2011 results. Langer's assistant, Evelyn Aubry, has prepared projected results for 2011 for Masson based on third-quarter results and other information she obtained from the company. Masson prepares its financial statements according to U.S. GAAP.

With his concerns about the effects of the economic slowdown and the acquisition on Masson's financial results, Langer is trying to determine the appropriate credit rating for Masson. To start his analysis, Langer summarizes key information for the last two years along with Aubry's projections for 2011, see Exhibit 1.

Exhibit 1
Masson Enterprises Inc.
Years Ended October 31
(all figures \$ millions except ROE)

| Year | Sales | Net Income | Total Assets | Total Liabilities | Total Equity | ROE |
|---|-------|------------|--------------|-------------------|--------------|-------|
| 2011p* | 4,820 | 160 | 2,410 | 945 | 1,465 | 10.9% |
| 2010 | 4,720 | 170 | 2,482 | 1,177 | 1,305 | 13.0% |
| 2009 | 4,605 | 175 | 2,110 | 975 | 1,135 | 15.4% |
| *projections including the expected sale of the distribution center | | | | | | |

During a meeting, Aubry brings to Langer's attention two transactions undertaken in 2011:

1. A large portion of Masson's centralized purchases is received at the distribution center in December and January, so that they are available to be shipped to the stores for the home renovation market's peak season, spring. In anticipation of an increasing volume of purchases from China and to protect against the weakening U.S. dollar, Masson purchased futures contracts on the yuan.
2. Masson has announced that at the end of the final quarter of fiscal 2011, it will sell its distribution center to Sequoia Corporation (Sequoia), an enterprise established, but not controlled, by Masson.

Langer and Aubry discuss how she reflected the sale of the distribution center in her financial projections and its impact on Masson's ratios.

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Aubry explains:

- Masson is selling the distribution center for \$200 million and thus will record a \$30 million gain, which I reflected in my projections as an increase in net income in 2011. There will be no taxes on this gain due to the availability of loss carry forwards.
- The \$10 million in annual rent expense Masson will pay to Sequoia for use of the center is the same as the annual depreciation expense they were taking on the center. Because the sale is at the end of the fiscal year, I took a full year's depreciation for 2011.
- Masson plans to use the proceeds from the sale to pay off debts, so I reduced the total liabilities.
- The net book value of the center would have been \$170 million at year-end, so by removing it from the balance sheet, the company shows an increase in its asset turnover and thus its ROA.

Langer responds:

I believe, based on the terms of the agreement, that Sequoia will qualify as a variable interest entity (VIE) and Masson will be considered the primary beneficiary.

He summarizes the terms of sale as follows:

1. Masson has signed a 14-year lease for the center with Sequoia. The agreed-upon fair value of the center, for the transfer, is \$200 million, which Masson intends to use to pay down long-term debt.
2. Sequoia is financing the purchase of the center through borrowing arrangements totaling \$192 million with a group of financial institutions. The land and building are pledged as collateral against these loans, and Masson will provide unconditional guarantees as well.
3. In return for the guarantees, Masson is eligible to appoint the majority of the directors to Sequoia's board.
4. Masson will receive the majority of the profits of Sequoia and absorb the majority of the losses, if any.

He further continues:

If it is a VIE, I wonder what revisions would be necessary to your projections and how they would affect our ratio calculations (which are all based on year-end balances).

-
43. The *most* appropriate way to account for the gains or losses on the futures contract that Masson bought is to record them in:
- A. other comprehensive income on a permanent basis.
 - B. net income in the period in which the gains and losses occur.
 - C. other comprehensive income, with recognition in net income when the transaction occurs.

Answer = C

"The Lessons We Learn," Pamela P. Peterson and Frank J. Fabozzi
2012 Modular Level II, Vol. 2, p. 338
Study Session: 7-25-c

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Describe the accounting treatment for derivatives being used to hedge:

- exposure to changes in the value of assets and liabilities,
- exposure to variable cash flow, and
- foreign currency exposure of investments in foreign corporations.

C is correct. The futures contract is a derivative being used to hedge the future cash flows from a forecasted transaction (the purchases from China), and hence the gains and losses are recognized in other comprehensive income until the forecasted transaction affects earnings (when the purchases occur), and then they are reclassified to net income.

44. Based on Aubry's projected information, how will the 2011 ratio of cash flow from operations to net income be affected as a result of the sale of the distribution center, compared to if the sale has not occurred? If the center is sold, the ratio will *most likely* be:
- A. lower.
 - B. higher.
 - C. the same.

Answer = A

"Integration of Financial Statement Analysis Techniques," Jack T. Ciesielski, Jr.

2012 Modular Level II, Vol. 2, pp. 440–442

Study Session: 7-27-e

Analyze and interpret the effects of balance sheet modifications, earnings normalization, and cash flow statement–related modifications on a company's financial statements, financial ratios, and overall financial condition.

A is correct. If Aubry's projections are correct, Masson will report a \$30 million dollar gain on the sale. This gain increases net income, but the gain is deducted from (the higher) net income in determining cash from operations, so there is no net effect on operating cash flow. (The full proceeds from the sale of an asset would be reported as an investing cash inflow.) Therefore, the ratio CFO/NI will decrease: Operating cash flow does not change, but net income is larger. (Because the sale occurs at the end of the year, there is no difference in depreciation expense for the year: The center would have a full year's depreciation whether sold or not, so it does not affect either cash flow or net income.)

45. Based on Aubry's projected information, if the company does not sell the distribution center, Masson's 2011 total debt to assets ratio would be *closest* to:
- A. 36.6%.
 - B. 44.4%.
 - C. 47.5%.

Answer = B

"Integration of Financial Statement Analysis Techniques," Jack T. Ciesielski, Jr.

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2012 Modular Level II, Vol. 2, pp. 425–430

Study Session: 7-27-d, e

Evaluate the effect on financial statements and ratios of a given change in accounting rules, methods, or assumptions.

Analyze and interpret the effects of balance sheet modifications, earnings normalization, and cash flow statement–related modifications on a company’s financial statements, financial ratios, and overall financial condition.

B is correct. Aubry’s projections (assuming sale of the distribution center) include reduction in the liabilities by the full proceeds of \$200 million and the assets by the \$170 million book value; therefore, if the center had not been sold, the liabilities and the assets would be higher by these amounts respectively.

Total debt to assets would be: $D/A = \frac{945+200}{2,410+170} = 44.4\%$

46. Which of the terms of the sale of the distribution center outlined by Langer is *least likely* a reason that Sequoia would qualify as a variable interest entity (VIE) of Masson?
- A. 1
 - B. 2
 - C. 3

Answer = A

“Intercompany Investments,” Susan Perry Williams

2012 Modular Level II, Vol. 2, pp. 163–164

Study Session: 6-22-a

Describe the classification, measurement, and disclosure under International Financial Reporting Standards (IFRS) for 1) investments in financial assets, 2) investments in associates, 3) joint ventures, 4) business combinations, and 5) special-purpose and variable interest entities.

A is correct. The sale and leaseback of an asset does not automatically make Sequoia a VIE. It is the inability of Sequoia to finance itself without financial support from others (Masson has provided unconditional guarantees) and the fact that the equity investors will not be able to make the decisions, as Masson controls the board, that would make the enterprise a VIE.

47. If Langer is correct in his belief about Sequoia, the *most* appropriate accounting treatment by Masson will be to:
- A. consolidate Sequoia.
 - B. disclose the arrangements in the notes to the financial statements only.
 - C. use the equity method to report Masson’s proportional interest in the enterprise.

Answer = A

“Intercompany Investments,” Susan Perry Williams

2012 Modular Level II, Vol. 2, pp. 163–164

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Study Session: 6-22-a

Describe the classification, measurement, and disclosure under International Financial Reporting Standards (IFRS) for 1) investments in financial assets, 2) investments in associates, 3) joint ventures, 4) business combinations, and 5) special-purpose and variable interest entities.

A is correct. Langer believes that Sequoia will qualify as a VIE and be considered the primary beneficiary. As primary beneficiary, Masson must fully consolidate Sequoia regardless of the amount of its equity investment.

48. If Langer is correct in his belief about Sequoia being a VIE, the revised projected ROE for Masson in 2011 would be *closest* to:

- A. 8.9%.
- B. 9.1%.
- C. 10.9%.

Answer = B

“Intercompany Investments,” Susan Perry Williams

2012 Modular Level II, Vol. 2, pp. 163–166

“Integration of Financial Statement Analysis Techniques,” Jack T. Ciesielski, Jr.

2012 Modular Level II, Vol. 2, p. 426

Study Session: 6-22-a, 7-27-e

Describe the classification, measurement, and disclosure under International Financial Reporting Standards (IFRS) for 1) investments in financial assets, 2) investments in associates, 3) joint ventures, 4) business combinations, and 5) special-purpose and variable interest entities.

Analyze and interpret the effects of balance sheet modifications, earnings normalization, and cash flow statement–related modifications on a company’s financial statements, financial ratios, and overall financial condition.

B is correct. If Langer is correct and Sequoia is a VIE, then on consolidation, net income would be reduced by the \$30 million gain and retained earnings (and total equity) would also decrease by the same amount.

| \$ millions | As Projected | Including Consolidation of VIE | Adjustment |
|--------------|--------------|--------------------------------|---|
| Net income | 160 | 130 | Deduct gain included in NI $160 - 30 = 130$ |
| Total equity | 1,465 | 1,435 | Deduct gain included in NI (and retained earnings) $1,465 - 30 = 1,435$ |
| ROE | | $\frac{130}{1,435} = 9.06\%$ | |

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National Plastics Case Scenario

National Plastics Corp. is a leading manufacturer of high-quality injection-molded plastic packaging materials used in various industries, primarily in the food and beverage industry. In late November 2010, the company received approval for two important patent applications—one providing for improved tamper protection for plastic containers and another for an improved biodegradable plastic film that allows for better food preservation.

On 4 January 2011, Haines Foods and Snacks, Inc. launched a hostile takeover bid for all of the shares of National at \$30 per share (which was a \$5 premium in excess of the pre-bid price). Haines Foods is a national supplier of deli and dairy products. If its bid is successful, it plans to continue to operate National as a wholly owned subsidiary.

Zenith ThermoPlastics Inc. produces plastic containers and bags that are used in the food and beverage industry. Keith Whelan, who is both chief executive officer and chief financial officer of Zenith, had been in discussions with National to either purchase or license its newly patented technologies. As a possible alternative, in view of the Haines bid, Whelan began to consider having Zenith make its own takeover bid for National.

Whelan provided National's most recent financial statements, as indicated in Exhibits 1 to 3, to one of his assistants, Mike Noth, with directions to calculate National's free cash flow as a first step in determining the maximum value that Zenith should be willing to pay for National's shares, using the discounted cash flow approach.

Exhibit 1
National Plastics Corp.
Selected Financial Data
(\$ millions, except per share amounts)

| For Year Ending 31 December | 2010 |
|--|-------------|
| Revenues | \$ 1,614 |
| Cost of goods sold | 841 |
| Selling, general, and administrative expense | 436 |
| Earnings before interest, taxes, depreciation, and amortization (EBITDA) | 337 |
| Depreciation expense | 61 |
| Operating income | 276 |
| Interest expense | 47 |
| Pretax income | 229 |
| Income tax (32%) | 73 |
| Net income | \$ 156 |
| Number of outstanding shares (millions) | 60 |
| 2010 Earnings per share | \$ 2.60 |
| 2010 Dividends paid (millions) | \$ 37 |
| 2010 Dividends per share | \$ 0.62 |

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Exhibit 2
National Plastics Corp.
Consolidated Balance Sheets
(\$ millions)

| At 31 December | 2010 | 2009 |
|--|-----------------|-----------------|
| Cash and cash equivalents | \$ 8 | \$ 5 |
| Other current assets | 315 | 295 |
| Total current assets | 323 | 300 |
| Long-term assets, net | 1,203 | 1,130 |
| Total assets | <u>\$ 1,526</u> | <u>\$ 1,430</u> |
| Current liabilities | \$ 696 | \$ 670 |
| Long-term debt | 562 | 611 |
| Common stockholders' equity | 268 | 149 |
| Total liabilities and stockholders' equity | <u>\$ 1,526</u> | <u>\$ 1,430</u> |

Exhibit 3
Other Financial Information for National Plastics Corp.
31 December 2010

| | |
|----------------------------------|-------|
| Effective tax rate | 32.0% |
| Cost of equity | 12.0% |
| Weighted-average cost of capital | 9.0% |

Noth soon returns and points out that the free cash flows from National will differ in future years as a result of its new patents—just as Zenith wanted to license the technology, he suggests that other plastic firms would also be interested. Noth also suggests that since National has a lower debt-to-equity ratio than the rest of the industry, it could support more debt, and he has adjusted the weighted-average cost of capital accordingly. Noth's projected cash flows and other estimates are provided in Exhibit 4.

| Exhibit 4 | | | | | |
|---|-------------|-------------|-------------|-------------|------------------------|
| Estimates and Assumptions of Mike Noth | | | | | |
| Used in Valuing National Plastics as of January 2011 | | | | | |
| (all numbers in \$ millions except WACC) | | | | | |
| | 2011 | 2012 | 2013 | 2014 | Thereafter |
| End-of-year free cash flow to firm | 170 | 165 | 180 | 195 | Growth at 5% per annum |
| Weighted-average cost of capital | 10.5% | | | | |
| Total debt immediately following acquisition | 650 | | | | |

After a discussion about the appropriate cash flow estimates and discount rates to use in determining the value of National to Zenith, Whelan decided that Zenith should make a mixed offer for all of National's shares for \$35 per share, consisting of \$23 in cash and Zenith common stock with an exchange ratio of 0.24. The details of the offer are found in Exhibit 5.

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| Exhibit 5 | | |
|--|--|-----------------------|
| Details of Zenith's Planned Tender Offer for All of National Plastics' Common Shares | | |
| | National Plastics | Zenith ThermoPlastics |
| Pre-merger price | \$25/share | \$50/share |
| Shares outstanding | 60 million | 100 million |
| | | |
| Tender offer | Zenith will pay \$35 per share for National, consisting of \$23 in cash and Zenith common shares with an exchange ratio of 0.24. | |
| Post-merger | Following the merger, Zenith's shares are expected to be priced at \$53/share. | |
| Synergies from merger | Zenith believes that most of the synergies arising from the merger result from National's new patents. | |

Because National and Zenith are both based in the United States, Whelan also decided to have Noth calculate the pre- and post-acquisition Herfindahl–Hirschman Index (HHI) for the industry. Noth's HHI calculations were 1,910 pre-acquisition and 2,170 post-acquisition. Based on the HHI values, Whelan concluded that:

- the industry is currently highly concentrated,
- but under applicable U.S. law, an increase in the HHI of less than 300 should not generate any governmental challenges to block the acquisition of National.

When Whelan presented Zenith's proposed takeover to his board the following day, one of the directors made the following comments:

1. While I am certainly in favor of this takeover, I think we would achieve the greatest value from the acquisition if we offer more stock and less cash.
2. Over the next few years, this merger should be good for our company, as the empirical evidence from merger studies indicates that acquirers normally outperform their peers during the three years following a merger.

49. If Haines Foods is successful in its attempt to acquire National Plastics, the business combination is *best* classified as which type of merger?

- A. Vertical, forward
- B. Vertical, backward
- C. Horizontal, conglomerate

Answer = B

"Mergers and Acquisitions," Rosita P. Chang and Keith M. Moore
 2012 Modular Level II, Vol. 3, pp. 242–243
 Study Session 9-32-a

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Classify merger and acquisition (M&A) activities based on forms of integration and types of mergers.

B is correct. If Haines acquires National, it would be a vertical merger as they are both in the same production chain. It is an example of backward integration as Haines is closer to the consumer than the packaging manufacturer.

50. National's free cash flow to the firm (FCFF) (in millions) for 2010 is *closest* to:

- A. \$104.
- B. \$121.
- C. \$182.

Answer = B

"Mergers and Acquisitions," Rosita P. Chang and Keith M. Moore

2012 Modular Level II, Vol. 3, pp. 268–271

"Free Cash Flow Valuation," Jerald Pinto, Elaine Henry, Thomas Robinson, and John Stowe

2012 Modular Level II, Vol. 4, pp. 280–283

Study Session 9-32-i, 12-40-c, d

Calculate free cash flows for a target company and estimate the company's intrinsic value based on discounted cash flow analysis.

Explain the appropriate adjustments to net income; earnings before interest and taxes (EBIT); earnings before interest, taxes, depreciation, and amortization (EBITDA); and cash flow from operations (CFO) to calculate FCFF and FCFE.

Calculate FCFF and FCFE.

B is correct.

| | | | |
|--|-----------------------------------|---------------------------------|------------|
| \$ in millions | | | |
| FCFF = NI + NCC + Int(1 – Tax Rate) – ΔWCInv – ΔFCInv | | | |
| Formula 7 in Reading 12-40: | | | |
| NI | Net Income | | 156 |
| +Int (1 – Tax rate) | +Net interest after tax | $47 \times (1 - 0.32)$ | 32 |
| | | | |
| | | | |
| +NCC | + Noncash charges | Depreciation Expense | +61 |
| –ΔWCInv* | – Changes in net working capital* | $(315^* - 696) - (295^* - 670)$ | +6 |
| –ΔFCInv | – Capital expenditures | $(1,203 - 1,130) + 61$ | –134 |
| FCFF | Free cash flow to firm | | 121 |
| *Change in net working capital excludes changes in cash and cash equivalents | | | |

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51. Based on Noth's assumptions in Exhibit 4, the most that Zenith should be willing to pay for each share of National is *closest* to:

- A. \$40.
- B. \$51.
- C. \$60.

Answer = A

"Mergers and Acquisitions," Rosita P. Chang and Keith M. Moore

2012 Modular Level II, Vol. 3, pp. 268–273

"Free Cash Flow Valuation," Jerald Pinto, Elaine Henry, Thomas Robinson, and John Stowe

2012 Modular Level II, Vol. 4, pp. 315–318

Study Session 9-32-i, 12-40-j

Calculate free cash flows for a target company and estimate the company's intrinsic value based on discounted cash flow analysis.

Estimate a company's value using the appropriate free cash flow model(s).

A is correct.

| Year | Free Cash Flow (\$ in millions) | PV of Free Cash Flow at 10.5% | | PV (\$ in millions) |
|--|------------------------------------|--|------------------------|---------------------------------|
| 2010 | 170 | $170 \div (1.105)$ | | 154 |
| 2011 | 165 | $165 \div (1.105)^2$ | | 135 |
| 2012 | 180 | $180 \div (1.105)^3$ | | 133 |
| 2013 | 195 | $195 \div (1.105)^4$ | | <u>131</u> |
| PV of FCF | | | | 553 |
| Terminal growth rate | | 5% | | |
| Terminal value, 2013 $\frac{FCF[2013] \times (1 + g)}{(r - g)}$ | | $\frac{195 \times (1.05)}{(0.105 - 0.05)}$ | = 3,722.73 | |
| Terminal value at start of 2010 | | | $3,723 \div (1.105)^4$ | <u>2,497</u> |
| Enterprise value | | | | 3,050 |
| Less debt after acquisition | | | | <u>650</u> |
| Maximum value of equity | | | | 2,400 |
| Maximum price per share (60 million shares) | | | | $2,400 \div 60 = \mathbf{\$40}$ |

52. Based on Zenith's proposed tender offer and information in Exhibit 5, the synergy arising from this merger (in millions) is *closest* to:

- A. \$643.
- B. \$943.
- C. \$1,063.

Answer = B

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"Mergers and Acquisitions," Rosita P. Chang and Keith M. Moore
2012 Modular Level II, Vol. 3, pp. 279–283

Study Session 9-32-k, I

Evaluate a merger bid, calculate the estimated post-merger value of an acquirer, and calculate the gains accrued to the target shareholders versus the acquirer shareholders.

Explain the effects of price and payment method on the distribution of risks and benefits in a merger transaction.

B is correct.

| Shares of Zenith outstanding after merger | | |
|--|--------------|--|
| Original from Zenith | 100 m | |
| Issued in acquisition | 14.4 m | 0.24 sh Acquirer/sh Target × 60 m |
| Total shares | 114.4 m | |
| Value of shares post-merger = \$53/sh × 114.4 m = \$6,063 million | | |
| Value of shares post-merger in terms of pre-acquisition values, synergies, and cash paid | | |
| Value pre merger of Zenith | \$5,000 | \$50/sh × 100 m sh |
| Value pre merger of National | 1,500 | \$25/sh × 60 m sh; price = \$30 – \$5 = \$25 |
| + Synergies | + X | Currently unknown |
| – Cash paid | –1,380 | \$23/sh × 60 m sh |
| Value of all shares post merger | 6,063 | Value from above |
| Synergies | <u>\$943</u> | Solve for X |
| * Value to National's s/h post merger is the actual amount paid for the takeover | | |
| "/sh" per share s/h: shareholder 100 m: 100 million shares, etc. | | |

53. The *most* accurate interpretation of Whelan's conclusions concerning the pre- and post-acquisition HHI is that they are:

- A. both correct.
- B. incorrect in regard to the industry being highly concentrated.
- C. incorrect in regard to the increase in HHI necessary to trigger a governmental challenge to the acquisition.

Answer = C

"Mergers and Acquisitions," Rosita P. Chang and Keith M. Moore
2012 Modular Level II, Vol. 3, pp. 264–266

Study Session 9-32-g

Calculate the Herfindahl–Hirschman Index and evaluate the likelihood of an antitrust challenge for a given business combination.

C is correct. An HHI greater than 1,800 indicates that an industry is highly concentrated. Should the HHI in a highly concentrated industry change by 50 or more, a governmental challenge to a particular business combination is very likely (see Exhibit 2 on page 265). In this instance, the

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industry is highly concentrated and the HHI changes by 260 making Whelan's second conclusion incorrect.

54. Which of the following statements made by the member of the Board of Directors is *most* accurate?
- A. Statement 1 only
 - B. Statement 2 only
 - C. Neither statement 1 nor 2

Answer = C

"Mergers and Acquisitions," Rosita P. Chang and Keith M. Moore
2012 Modular Level II, Vol. 3, pp. 279–284

Study Session 9-32-I, m

Explain the effects of price and payment method on the distribution of risks and benefits in a merger transaction.

Describe the empirical evidence related to the distribution of benefits in a merger.

C is correct. Both statements are incorrect: [1] The more of the merger that is paid for by stock, the more that the risks and benefits of realizing these synergies (assuming they really exist) will be passed on to the target shareholders—hence a lower benefit to the acquiring company will result if more stock is used.

[2] The empirical evidence shows that acquirers tend to underperform comparable companies during the three years following an acquisition.

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Western Investments Analytics Case Scenario

Western Investment Analytics specializes in the valuation of thinly traded equities. Harriet Hilliard, one of Western's analysts, is currently working to establish the value of Hattie's Apparel, a small textile and clothing wholesaler headquartered in the southern United States. Hattie's Apparel is a publicly traded company; however, in a typical week fewer than 1,000 shares trade. Triway Textiles, Inc. is a NASDAQ-listed stock that very closely resembles Hattie's Apparel's business activities but is far more actively traded.

Exhibit 1 provides summary financial and economic data relating to Hattie's Apparel and Triway Textiles along with Hilliard's estimates of the responsiveness (i.e., the betas) of the companies to the factors of the Fama–French model [equity risk premium factor (RMRF); market capitalization factor (SMB); and book-to-market factor (HML)]. Exhibit 1 also includes a published estimate of the CAPM equity beta for Triway. Since Hattie's Apparel does not have a published estimate of its CAPM equity beta, as few analysts follow the stock, Hilliard computes it, noting the difference in leverage between Triway Textiles and Hattie's Apparel.

| Exhibit 1 Hattie's Apparel and Triway Textiles Selected Financial Information | | |
|--|-------------------------|------------------------|
| | Hattie's Apparel | Triway Textiles |
| Debt beta | 0.00 | 0.00 |
| Debt-to-equity ratio (market values) | 45% | 38% |
| Pretax cost of debt | 9% | 8% |
| Marginal tax rate | 32% | 32% |
| RMRF beta | 0.82 | 0.75 |
| SMB beta | 0.75 | 0.00 |
| HML beta | 0.15 | 0.05 |
| CAPM equity beta | | 0.75 |
| Assumed constant growth rate (g) | 3% | 2.5% |
| Most recent price (P_0) | \$45.00 | \$115.48 |
| Most recent dividend (D_0) | \$2.75 | 8.45 |
| Payout ratio | 40% | 55% |

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Exhibit 2 provides Hilliard’s estimates of market information relating to her analysis. Western’s analysts typically use three models to estimate the required return on equity for the companies they evaluate: the Gordon growth dividend discount model (DDM), the capital asset pricing model (CAPM), and the Fama–French model (FFM). Nonetheless, in her work, Hilliard prefers to use the DDM-based estimate of the required return on equity when she calculates the weighted-average cost of capital (WACC) for companies such as Hattie’s Apparel.

| Exhibit 2 Additional Market Information | |
|--|----|
| U.S. T-bill rate | 1% |
| Equity risk premium | 8% |
| Market capitalization factor | 2% |
| Book-to-market factor | 4% |

Matthew Colbaugh, Hilliard’s supervisor, recommends to Hilliard that she add two approaches to her analytical tool bag.

- First, he suggests using the Pastor–Stambaugh model (PSM) extension of the FFM.
- Second, he suggests that he would like to see a comparison of Hattie’s Apparel’s P/E-to-growth ratio (PEG) to Triway Textile’s PEG. “Even if you base the PEG analysis on current prices, earnings, and estimates of growth rather than their forward-looking equivalents, the relative PEG of Hattie’s Apparel compared to that of Triway Textiles is of interest to me,” states Colbaugh.

Colbaugh also criticizes Hilliard’s use of the published CAPM equity beta for Triway. Lastly, Colbaugh suggests that applying Blume’s adjustment to Triway’s published CAPM equity beta would improve the *ex ante* properties of her analysis.

55. Using the information reported in Exhibit 1 and the approach Hilliard uses, the equity beta for Hattie’s Apparel is *closest* to:

- A. 0.71.
- B. 0.79.
- C. 0.84.

Answer = B

“Return Concepts,” John Stowe, Thomas Robinson, Jerald Pinto, and Dennis McLeavey
 2012 Modular Level II, Vol. 4, pp. 78–79
 Study Session 10-35-b, d

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

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

B is correct. First, calculate the unlevered beta of the benchmark (Triway Textiles):

$$\beta_U = \left[\frac{1}{1 + \left(\frac{D}{E} \right)} \right] \beta_E = \left[\frac{1}{1.38} \right] 0.75 = 0.54348$$

Then calculate the equity beta for Hattie's Apparel as:

$$\beta'_E = \left[1 + \left(\frac{D'}{E'} \right) \right] \beta_U = 1.45 \times 0.54348 = 0.78805.$$

56. Using the information reported in Exhibit 1 and Exhibit 2, the Fama–French estimate of the required return on equity for Hattie's Apparel is *closest* to:

- A. 8.0%.
- B. 8.7%.
- C. 9.7%.

Answer = C

"Return Concepts," John Stowe, Thomas Robinson, Jerald Pinto, and Dennis McLeavey
2012 Modular Level II, Vol. 4, pp. 80–84

Study Session 10-35-c

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

C is correct. The Fama–French estimate of the required return on equity is calculated as:

$$r_i = R_F + \beta_i^{mkt} RMRF + \beta_i^{size} SMB + \beta_i^{value} HML$$

For the given information we have:

$$r_i = 0.01 + 0.82 \times 0.08 + 0.75 \times 0.02 + 0.15 \times 0.04 = 0.09660 = 9.7\%$$

57. Using the values reported in Exhibit 1 and Hilliard's preferred approach, the WACC for Hattie's Apparel is *closest* to:

- A. 6.2%.
- B. 7.9%.
- C. 8.3%.

Answer = C

"Return Concepts," John Stowe, Thomas Robinson, Jerald Pinto, and Dennis McLeavey

"Discounted Dividend Valuation," Jerald Pinto, Elaine Henry, Thomas Robinson, and John Stowe

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2012 Modular Level II, Vol. 4, pp. 93–94, 225

Study Session 10-35-g, 11-39-m

Explain and calculate the weighted-average cost of capital for a company.

Estimate a required return based on any DDM, including the Gordon growth model and the H-model.

C is correct. Hilliard prefers to use the DDM-based estimate for return on equity in the WACC.

$$WACC = \frac{MVD}{MVD+MVCE} r_d (1 - \text{Tax rate}) + \frac{MVCE}{MVD+MVCE} r$$

$\frac{MVD}{MVD+MVCE}$ is the market based weight of debt for the firm and $\frac{MVCE}{MVD+MVCE}$ is the weight of equity. In this case, with a debt-to-equity ratio of 45%,

Hattie's Apparel has a weight of debt of 0.31034 (calculated as 0.45/1.45).

The weight of equity is 0.68966 (calculated as 1 – 0.31034).

The pretax cost of debt is 9%, and the tax rate is 32%.

The cost of equity is calculated using the Gordon model as:

$$\frac{2.75 \times 1.03}{45} + 0.03 = 0.9294.$$

The WACC is: $[0.31034 \times 0.09 \times (1 - 0.32)] + [0.68966 \times 0.09294] = 0.08309 = 8.3\%$.

58. If Hilliard adopts Colbaugh's first recommendation regarding the use of additional analytical models, which of the following will she *most likely* incorporate into her analysis? An estimate of risk pertaining to:

- A. liquidity.
- B. time horizon.
- C. business cycle.

Answer = A

"Equity Valuation: Applications and Processes," Jerald Pinto, Elaine Henry, Thomas Robinson, and John Stowe

2012 Modular Level II, Vol. 4, pp. 84–85

Study Session 10-34-c

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

A is correct. Colbaugh's first recommendation pertains to the use of the Pastor–Stambaugh model, which adds a fourth factor to the FFM—compensation for the degree of liquidity of an equity investment.

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59. If Hilliard adopts the second recommendation of Colbaugh regarding additional analytical models, which of the following *best* describes the result? The metric suggested by Colbaugh:

- A. shows Hattie's Apparel is less attractive than Triway Textiles.
- B. assumes that the relationship between P/E and growth is nonlinear.
- C. fails to capture differences in risk between Hattie's Apparel and Triway Textiles.

Answer = C

"Market-Based Valuation: Price and Enterprise Value Multiples," Jerald Pinto, Elaine Henry, Thomas Robinson, and John Stowe

2012 Modular Level II, Vol. 4, pp. 387–388

Study Session 12-41-k

Calculate and interpret the P/E-to-growth ratio (PEG) and explain its use in relative valuation.

C is correct. Colbaugh suggests comparing Hattie's PEG to Triway's PEG. PEG is useful but must be used with care: PEG assumes a linear relationship between P/E and growth, does not factor in differences in risk, and does not account for differences in the duration of growth. Further, per computations shown below, Hattie's Apparel is more attractive than Triway Textiles based on PEG, not less attractive.

| | Dividends | Payout Ratio | EPS | Price | P/E | Growth | PEG |
|------------------|-----------|--------------|------------------------|--------|-----------------------------|--------|---------------------|
| Hattie's Apparel | 2.75 | 0.40 | $2.75/0.40 = 6.875$ | 45 | $45/6.875 = 6.54545$ | 3% | $6.54545/3 = 2.2$ |
| Triway Textiles | 8.45 | 0.55 | $8.45/0.55 = 15.36364$ | 115.48 | $115.48/15.36364 = 7.51645$ | 2.5% | $7.51645/2.5 = 3.0$ |

60. According to the last suggestion made by Colbaugh, the CAPM equity beta for Triway Textiles is *closest* to:

- A. 0.83.
- B. 0.86.
- C. 0.92.

Answer = A

"Return Concepts," John Stowe, Thomas Robinson, Jerald Pinto, and Dennis McLeavey

2012 Modular Level II, Vol. 4, p. 74

Study Session 10-35-d

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

A is correct. Colbaugh's last suggestion is to apply Blume's adjustment to the published CAPM equity beta.

Blume's adjusted beta = $(2/3) \times (\text{Unadjusted beta}) + (1/3) \times (1.0)$

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Triway's beta with Blume's adjustment = $(2/3) \times (0.75) + (1/3) \times (1.0) = 0.8333$

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