

# ADVF Model Solutions

## Spring 2013

### 1. Learning Objectives:

1. The candidate will understand measures of corporate value and be able to analyze the data in corporate financial statements.

### Learning Outcomes:

- (1c) Describe the concept of economic measures of value (e.g. MCEV) and demonstrate their uses in the risk management and corporate decision-making processes.
- (1d) Compare and contrast various regulatory/industry reserve and capital frameworks.

### Sources:

Fair Valuation of Insurance Liabilities: Principles and Methods, AAA Monograph, September 2002 [http://www.actuary.org/pdf/finreport/fairval\\_sept02.pdf](http://www.actuary.org/pdf/finreport/fairval_sept02.pdf)

AF-110-12: CRO Forum “A Market Cost of Capital Approach to Market Value Margins” paper (sections 1 – 3 background only)

AF-111-12: A Comparative Analysis of U.S., Canadian and Solvency II Capital Adequacy

### Commentary on Question:

*This question tested candidates’ understanding of Market Cost of Capital and the Solvency II Framework as it relates to the Solvency Capital Requirement. Parts (a) and (b) tested candidates’ Retrieval cognitive abilities, while part (c) tested candidates’ Comprehension of the material.*

### Solution:

- (a) Describe Market Value Margin (MVM).

### Commentary on Question:

*Candidate performance on this section was mediocre, with many candidates having difficulty in giving a verbal description of the concept rather than using it in a calculation. Some of the unsuccessful candidates confused the MVM concept with a margin related to solvency and/or capital.*

The market value margin (MVM) is a risk margin, in addition to the expected present value of future liability cash flows, required to manage the business on an ongoing basis.

# 1. Continued

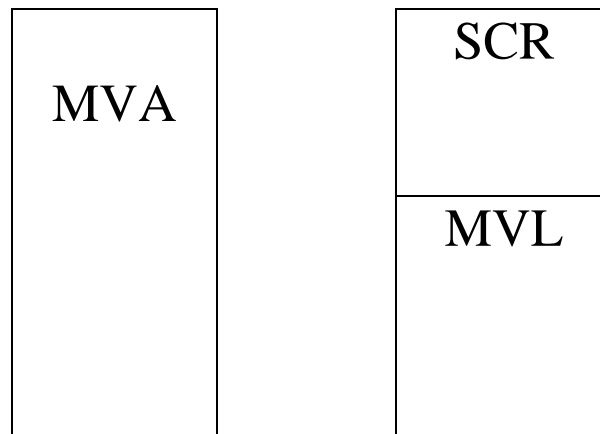
(b)

- (i) Sketch the three main components of the Economic Balance Sheet.
- (ii) Identify which of the components in part (i) includes the MVM.

**Commentary on Question:**

*As requested by the question, a sketch of the three main components, rather than a mere listing, was required to earn full credit. Excess capital was not necessary to be on the sketch to earn full credit. Overall, most candidates did well on this part, with the most common errors being not including a sketch or leaving out the SCR.*

(i)



MVA = Market Value of Assets  
MVL = Market-consistent Value of Liabilities  
SCR = Solvency Capital Requirement

- (ii) The MVL contains the MVM.

(c)

- (i) Define Solvency Capital Requirement (SCR).
- (ii) Explain how SCR is calculated under Solvency II.
- (iii) Provide the general formula used to combine capital requirements for component risks at each aggregation level.

## 1. Continued

### Commentary on Question:

*Candidates performed reasonably well on this question, with most candidates earning points for parts (ii) and (iii), though some struggled to give a verbal definition of SCR in part (i). The most common error in (ii) was not explaining what the VaR was calculated on (i.e. the change in economic surplus). For part (iii), the equivalent formula in matrix multiplication form was also accepted for full credit.*

- (i) The SCR is the target level of capital below which the regulator will take action to restore the financial health of the insurer.
- (ii) Under Solvency II, the SCR corresponds to the 99.5% VaR (Value at Risk) of the change in economic surplus over a one-year horizon.
- (iii) SCR =

$$\sqrt{\sum_i \sum_j \rho(i, j) \cdot SCR_i \cdot SCR_j}$$

where  $\rho(i, j)$  is the correlation between risks  $i, j$  and  $SCR(i)$  is the solvency capital requirement for risk  $i$

## 2. Learning Objectives:

2. The candidate will understand how the risks faced by an entity can be quantified and the use of metrics to measure risk.

### Learning Outcomes:

- (2d) Explain various approaches for the measurement of liquidity risk.

### Sources:

AF-107-12: Liquidity Risk – Measurement and Management, Matz and Neu editors, Chapters 2 and 3

### Commentary on Question:

*This question tested candidates' understanding of liquidity risk. Overall, candidates performed marginally well on sections where only straightforward responses from the syllabus were needed, but performance was poor when deeper application of the concepts was required. Part (a) tested candidates' Analysis cognitive level, parts (b) and (c) were at a Comprehension level, and part (d) was Knowledge Utilization.*

### Solution:

- (a) Rank the liquidity risk of the liabilities from highest to lowest. Justify your ranking.

### Commentary on Question:

*Many candidates switched the order of long-term non-bank deposits and insured CD deposits. The liquidity risk is more affected by the guaranteed nature of the CDs than by the duration of the long-term deposits.*

*Merely saying that one liability had a longer duration and was therefore less liquid was not an acceptable answer.*

From highest to lowest liquidity risk:

- Short-term bank deposits
- Long-term non-bank deposits
- Insured CD deposits
- 40-year payout annuities

Short-term unsecured bank deposits are "volatile" liabilities, with cash flows driven by market rates, changes in credit risk, and counterparty confidence.

Core long-term non-bank deposits can be considered "stable", long-term funding (where core specifically refers to the balance amount that will not run off within the first month)

Insured 3-year CD deposits have contractual cash flows with limited market exposure until renewal

## 2. Continued

40-year payout annuities with no cash surrender value have contractually fixed cash flows where the only variable is time

- (b) Calculate Moody's cash capital position for Zirkel.

**Commentary on Question:**

*This section proved challenging for many candidates. Most candidates were able to properly apply the haircut to the assets. Partial credit was given for calculating up to that point. On the liabilities, many candidates included CD liability value with the short-term funding and non-core non-bank funding. Alternative methods of calculation were acceptable.*

Moody's Cash Capital (CC) = Collateral Value of Unencumbered Assets minus Short-Term Funding and Non-core Non-Bank Funding

Collateral Value of Unencumbered Assets = Current Market Value of Assets \* (1 - Haircut)

Unencumbered Cash Asset:  $10 * (1 - 0\%) = 10$

Unencumbered Bonds Asset:  $100 * (1 - 15\%) = 85$

Unencumbered PP Equity Asset:  $100 * (1 - 60\%) = 40$

Short-Term Funding and Non-core Non-Bank Funding = 100 (Short-Term Unsecured Bank Deposit)

$CC = (10 + 85 + 40) - 100 = 35$

- (c) Describe two additional liquidity risk measures Zirkel can use to evaluate its liquidity risk.

**Commentary on Question:**

*The best candidates were able to answer this part of the question succinctly. They named two risk measures and used one or two sentences or formulae to describe the risk measure. Several alternatives to the answers were given full credit.*

**Maturity Mismatch Approach:** net cumulative cash outflows on unencumbered assets are estimated per time period

**Liquidity (or Net Cumulative) Gap Profile:** net cumulative inflows minus net cumulative outflows without new loan or rollover funding

- (d) Evaluate the short-term and long-term liquidity risk Zirkel currently faces.

**Commentary on Question:**

*For both the short-term and long-term liquidity risks, the candidate should specifically state their evaluation of the risk and then give reasons for that assertion. The examples given below are not the only answers available for full credit. Some candidates used the balance sheet approach to calculate both short- and long-term liquidity risk.*

## 2. Continued

Zirkel has significant short-term liquidity risk.

Using liquidity gap profile:

Short-term cash outflow could be 100 from short-term bank deposits

Outflow of 100 met with 10 Cash + 85 Bonds + 5 PP Equity (after haircuts)

Assets liquidated to get 100: 10 Cash + 100 Bonds + 12.5 PP Equity

Remaining Assets: 87.5 PP Equity

Remaining Liabilities: 50 Annuity + 30 Core Deposits + 20 CDs = 100

Assets < Liabilities: Zirkel insolvent after meeting short-term liquidity need.

Zirkel has some long-term liquidity risk, but not as much as it has short-term liquidity risk.

Using the maturity mismatch approach:

Long-term bonds and less marketable private placement equity assets fund 3-year CDs and core deposits. Cash flows are not well matched, which may result in future losses.

### 3. Learning Objectives:

2. The candidate will understand how the risks faced by an entity can be quantified and the use of metrics to measure risk.

#### Learning Outcomes:

- (2c) Explain various approaches for the measurement of credit risk.

#### Sources:

Saunders and Allen, Credit Risk Management In and Out of the Financial Crisis

- Chapter 4, Loans as Options: The Moody's KMV Model
- Chapter 6, Other Credit Risk Models

#### Commentary on Question:

*Candidates were expected to demonstrate an understanding of the workings of and fundamental differences between Moody's KMV and Altman's Z-score credit risk models, synthesizing various chapters from the Saunders and Allen reading. Overall, candidates performed well in parts (a) and (b), but struggled with part (c), with many candidates merely giving a description of each model rather than comparing and contrasting them as the question instructed. Parts (a) and (b) tested candidates' Comprehension of the material, while part (c) tested their Analysis cognitive abilities.*

#### Solution:

- (a) Calculate Ouray's theoretical expected default frequency (EDF<sup>TM</sup>), according to the Moody's KMV model of credit risk, assuming future asset values are normally distributed around the firm's current asset value. Show your work.

#### Commentary on Question:

*Candidates generally did well on this question as it was an adaption of an example from the reading. The most common mistake was attempting to calculate the volatility of assets (multiplying assets by an assumed volatility %), rather than using the given value. Any weight between 0 and 1 for Long Term Debt was accepted without penalty, as the text suggests 1/2 but notes arguments for other values can be made.*

$$\text{EDF} = 1 - \Phi(\text{DD}), \text{ where DD (Distance to Default)} = (A - B) / \sigma_A$$

$$A = \text{MV Assets} = \text{MV Liabilities} + \text{MV Equity} = 35 + 20 + 15 = 70$$

$$\sigma_A = \text{Volatility of Assets} = 10$$

$$B = \text{Default (Exercise) Point} = \text{Short Term Liabilities} + 1/2 * \text{Long Term Debt} = 35 + 1/2 * 20 = 45$$

$$\text{DD} = (70 - 45) / 10 = 2.5 \text{ (standard deviations)}$$

$$\text{EDF} = 1 - \Phi(\text{DD}) = 1 - 0.9938 = 0.0062 \text{ or } 0.62\%$$

### 3. Continued

- (b) Describe the Altman Z-score model.

**Commentary on Question:**

*Candidates generally performed well on this part, though many didn't include how the weights in the Altman Z-score model are determined.*

The Altman Z-score credit scoring model is a linear combination of several accounting ratios, where the variables and their weights are determined through linear discriminant analysis on a matched sample of failing and surviving firms.

- (c) Compare and contrast the Moody's KMV and Altman Z-score models.

**Commentary on Question:**

*As a two-point question, it was expected that candidates would give a thoughtful analysis of the similarities and differences of the two models. However, many candidates merely gave a description of each model rather than comparing and contrasting them as the question instructed. As a result, candidates generally did poorly on this question, though partial credit was awarded where an understanding of the two models was demonstrated. In addition to those answers below, other answers from the source were also accepted for credit.*

Moody's KMV model, which is forward-looking as it uses stock market data, is highly responsive to changes in financial condition, unlike Altman's Z-score model, which is backward-looking as it uses book value accounting data, cannot identify firms whose condition is rapidly deteriorating.

While the Altman Z-score credit rating model has a relatively high degree of accuracy, it underperforms structural models such as Moody's KMV.

As a structural model, Moody's KMV has strong theoretical underpinnings while Altman's Z-score model is not theoretically based (e.g. the model is linear while the path to bankruptcy may be highly nonlinear).



#### 4. Learning Objectives:

3. The candidate will understand various means available for managing risk and capital.

#### Learning Outcomes:

- (3a) Explain why risk management adds value to a firm.

#### Sources:

AF-111-12: Doherty, Integrated Risk Management, Chapter 7: Why is Risk Costly to a Firm?

#### Commentary on Question:

*This question tested candidates' understanding of several fundamental concepts as presented in the Doherty reading. Part (a) tested the candidates' Comprehension of the material while part (b) was a deeper Analysis question.*

#### Solution:

- (a)  
(i) Complete the table below assuming Eolus invests in Project A.

	Value after Investing in Project A		
	Bad Scenario	Good Scenario	Expected Value
Value of Capital	<b>500</b>	<b>1700</b>	1100
Value of Debt	<b>500</b>	<b>600</b>	<b>550</b>
Value of Equity	<b>0</b>	<b>1100</b>	<b>550</b>

- (ii) Complete the table below assuming Eolus invests in Project B.

	Value after Investing in Project B		
	Bad Scenario	Good Scenario	Expected Value
Value of Capital	<b>100</b>	<b>2100</b>	1100
Value of Debt	<b>100</b>	<b>600</b>	<b>350</b>
Value of Equity	<b>0</b>	<b>1500</b>	<b>750</b>

#### Commentary on Question:

*Answers shown above in boldface. An important aspect of answering this question was the knowledge that the value of equity could not go negative. Some candidates did not change the value of debt based on the capital calculation. Since "show your work" was not part of the question, simply completing the tables as shown above was sufficient for full credit, with partial credit given for partially correct tables. For completeness, the logic for completing the tables is as follows:*

## 4. Continued

### **PROJECT A:**

#### **Bad Scenario:**

$$\text{Capital (Bad)} = 400 + 200 - 100 = 500$$

$$\text{Debt (Bad)} = \text{MIN}(600, 500) = 500$$

$$\text{Equity (Bad)} = 500 - 500 = 0$$

#### **Good Scenario:**

$$\text{Capital (Good)} = 1600 + 200 - 100 = 1700$$

$$\text{Debt (Good)} = \text{MIN}(600, 1700) = 600$$

$$\text{Equity (Good)} = 1700 - 600 = 1100$$

#### **Expected Value:**

$$E[\text{Capital}] = 50\% * 500 + 50\% * 1700 = 1100 \text{ (this is given)}$$

$$E[\text{Debt}] = 50\% * 500 + 50\% * 600 = 550$$

$$E[\text{Equity}] = 50\% * 0 + 50\% * 1100 = 550$$

### **PROJECT B:**

#### **Bad Scenario:**

$$\text{Capital (Bad)} = 400 - 200 - 100 = 100$$

$$\text{Debt (Bad)} = \text{MIN}(600, 100) = 100$$

$$\text{Equity (Bad)} = 100 - 100 = 0$$

#### **Good Scenario:**

$$\text{Capital (Good)} = 1600 + 600 - 100 = 2100$$

$$\text{Debt (Good)} = \text{MIN}(600, 2100) = 600$$

$$\text{Equity (Good)} = 2100 - 600 = 1500$$

#### **Expected Value:**

$$E[\text{Capital}] = 50\% * 100 + 50\% * 2100 = 1100 \text{ (this is given)}$$

$$E[\text{Debt}] = 50\% * 100 + 50\% * 600 = 350$$

$$E[\text{Equity}] = 50\% * 0 + 50\% * 1500 = 750$$

(b)

- (i) Explain why Eolus may reject the guaranteed return of Project A in favor of the uncertain return of Project B.

#### **Commentary on Question:**

*Part (b)(i) expects the candidate to describe or explain why a company would choose a risky investment over a risk free investment. This part was influenced by the answers in part (a), and a candidate with incorrect results in those parts may have a different explanation that was still eligible for full credit.*

*This question tests the concept of asset substitution. Full credit was given to candidates that described the concept as well as those who mentioned asset substitution here.*

## 4. Continued

*Candidates may word this in quite a different way. The following were the key points:*

- 1) the expected payoff is better, because*
- 2) debt holders must absorb losses after a certain point.*

Shareholders have more influence than debt holders in the decision-making processes in a firm such as Eolus.

$E[\text{Equity}]$  for risky Project B = 750 > 550 =  $E[\text{Equity}]$  for risk-free Project A

Shareholders will prefer Project B, which has a higher payoff than Project A in the Good Scenario and an equal payoff in the Bad Scenario, since shareholders enjoy limited losses, the remainder being passed on debt holders.

- (ii) Explain how the selection of Project B could ultimately reduce shareholder value.

### **Commentary on Question:**

*As in part (b)(i), the wording of this question does not require candidates to say "this is underinvestment" but merely describe it; however, credit was given for those who specifically mention underinvestment here.*

*Some candidates wrote that shareholders were harmed when project B was selected and the bad scenario outcome is realized. This, by itself, did not receive any credit.*

*For full credit, the candidate could explain the increase in the cost of debt through a reduction of credit rating or refer to the increased cost of future or new debt.*

Without considering capital structure, Project B is riskier than Project A with no additional reward. Debt holders will anticipate that shareholders will choose risky projects like Project B at the expense of debt holders.

Because debt holders cannot directly influence a firm's decision making process, they will do so indirectly by raising the cost of debt when the firm chooses Project B, in order to be compensated for the risk (of asset substitution).

The increased cost of capital could reduce shareholder value by more than the positive impact on shareholder value from choosing Project B.

#### **4. Continued**

*Another way of saying this last point is that the higher cost of debt could turn positive NPV projects into negative ones. A candidate could also reference that good projects are “crowded out.”*

## 5. Learning Objectives:

1. The candidate will understand measures of corporate value and be able to analyze the data in corporate financial statements.

### Learning Outcomes:

- (1c) Describe the concept of economic measures of value (e.g. MCEV) and demonstrate their uses in the risk management and corporate decision-making processes.

### Sources:

AF-100-12: Insurance Industry Mergers & Acquisitions, Toole and Herget, 2005, Chapter 4: Valuation Techniques (sections 1-5 only)

### Commentary on Question:

*This question deals with the valuation of an acquisition. Candidates generally performed well on the calculations but less so on the non-calculation parts, a general trend observed on many exam questions. Part (a) was at the Comprehension cognitive level, part (b) was Retrieval, part (c) was also Comprehension, and part (d) was Analysis.*

### Solution:

- (a) Calculate an appropriate discount rate for use in this acquisition appraisal using the Capital Asset Pricing Model (CAPM). Show your work.

#### Commentary on Question:

*Candidates in general had little difficulty with this part.*

$$r = r_f + \beta^*(r_m - r_f)$$

where  $r$  = CAPM discount rate

$r_f$  = risk-free rate of return

$r_m$  = expected rate of return for the market

$\beta$  = measure of company risk relative to the market as a whole

$$r = 3\% + 1.2 \times (10\% - 3\%) = 11.4\%$$

- (b) Describe two other methods for selecting a discount rate for use in valuing an acquisition.

#### Commentary on Question:

*Performance here was mixed. Successful candidates provided both the name of the method and a description of the methodology. Other answers than those shown below were also acceptable.*

**Internal Company Targets:** a minimum benchmark (or hurdle rate) used to evaluate possible acquisitions

## 5. Continued

**Cost of Funds for Transaction:** the overall WACC (weighted average cost of capital) of financing used to evaluate the deal

- (c) Calculate an Actuarial Appraisal Value of Half using the projected values above and the CEO's prescribed discount rate of 12%. Show your work.

**Commentary on Question:**

*Many candidates did well with the distributable earnings and discounting but fewer did well with the initial excess capital and change in required capital. Alternatives to the method shown below were also accepted.*

**Actuarial Appraisal Value** = Net Present Value (NPV) of Distributable Earnings (DE), where  $NPV(DE) = \text{Excess Capital} + NPV(\text{After-tax Statutory Profits} + \text{Decrease in Required Capital})$

	Year 1	Year 2	Year 3
Decrease in Required Capital	$= 3 - 2 = 1$	$= 2 - 1 = 1$	$= 1 - 0 = 1$
Distributable Earnings	$= 15 + 1 = 16$	$= 10 + 1 = 11$	$= 5 + 1 = 6$
Discounted Distributable Earnings	$= 16/(1.12)$	$= 11/(1.12)^2$	$= 6/(1.12)^3$
	$= 14.29$	$= 8.77$	$= 4.27$
Excess Capital = 3			
$NPV(DE) = 3 + 14.29 + 8.77 + 4.27 =$			<b>30.33</b>

- (d) Half's investment bank is evaluating the acquisition using the Comparable Transaction Analysis method.
- (i) Describe the Comparable Transaction Analysis method.
- (ii) Contrast the Comparable Transaction Analysis method with the Actuarial Appraisal Value method.

**Commentary on Question:**

*Successful candidates provided direct contrasts between the two methods, rather than merely describing each method, which only received partial credit.*

- (i) In Comparable Transaction Analysis, analysts review financial data relating to recent arm's length transactions to determine what buyers have paid for similar companies.
- (ii) Actuarial appraisal value uses projected statutory earnings and capital (or does not use GAAP), while comparable transaction analysis uses GAAP book value (and consider PGAAP adjustments). Also, actuarial appraisal value ignores transaction structure and financing while comparable transaction analysis distinguishes leveraged and unleveraged financial metrics.

## 6. Learning Objectives:

2. The candidate will understand how the risks faced by an entity can be quantified and the use of metrics to measure risk.

### Learning Outcomes:

- (2a) Demonstrate an understanding of a variety of quantitative risk measures.
- (2b) Articulate shortcomings of statistical risk measures.

### Sources:

AF-113-12: Sweeting, 15.4, Risk Measures

AF-114-12: Black Monday and Black Swans, J. Bogle, Financial Analysts Journal, 64:2 (30 – 40), 2008

### Commentary on Question:

*This question primarily tested candidates' understanding of value at risk and its limits. Candidates are expected to understand various calculation methods for value at risk, as well as the pros and cons of each method. The last part tests candidates' qualitative understanding of shortcomings of relying on historical observations, which are described at length in the "Black Monday and Black Swans" reading. Candidates performed very well on parts (a) and (c), but had more difficulty with parts (b) and (d). Parts (a) – (c) tested candidates' Comprehension of the material, while part (d) tested their Analysis cognitive abilities.*

### Solution:

- (a) Calculate the daily Value at Risk (VaR) at both 99% and 90% for this equity fund, using each of the approaches below. Show your work
  - (i) Empirical approach
  - (ii) Parametric approach, assuming that daily returns are normally distributed

### Commentary on Question:

*Answers for Relative VaR (10.94% and 1.99%, respectively for (i), and 5.98% and 3.29%, respectively for (ii)) were also accepted. For (i), corresponding answers for the  $(n*(1 - \alpha))$ th largest loss were also accepted. Most candidates performed well on this part, though some candidates received only partial credit due to being inconsistent in their VaR calculations (absolute vs. relative) in parts (i) and (ii) without explanation.*

- (i) VaR is the  $(n*\alpha)$ th smallest loss  
 $VaR_{99\%} = 990$ th smallest loss = 10.88%, and  
 $VaR_{90\%} = 900$ th smallest loss = 1.93%

## 6. Continued

- (ii) VaR is  $\Phi^{-1}(\alpha)$  standard deviations above the mean loss  
 $\text{VaR}_{99\%} = -0.06\% + 2.57\% * 2.326 = 5.92\%$ , and  
 $\text{VaR}_{90\%} = -0.06\% + 2.57\% * 1.282 = 3.23\%$

- (b) Describe the advantages and disadvantages of each of the two approaches used in part (a).

**Commentary on Question:**

*Few candidates received full credit on this part, as many candidates kept their responses too brief to receive full credit.*

The empirical approach has advantages in that it is simple and realistic, avoiding the need for assumptions for the distribution of returns.

The empirical approach has disadvantages in that it is unsuitable if the portfolio or economic circumstances changes over time, and it can never reflect the full range of possible future scenarios (e.g. does not capture "black swans").

The parametric approach has advantages in that it is easy to calculate and reduces dependence on actual historical profits and losses.

The parametric approach has disadvantages in that it is more difficult to explain and that the normal distribution is often inappropriate for modeling investment returns.

- (c) Describe two disadvantages of VaR as a risk measure, regardless of the approach used in part (a).

**Commentary on Question:**

*Candidates performed well on this question, with the two most common answers being listed below. Other valid critiques of VaR's use as a risk measure were also accepted for credit. Candidates giving more than two disadvantages did not receive credit for the additional responses.*

VaR is not a coherent risk measure because it is not sub-additive.

VaR does not provide information regarding the distribution of extreme events, and gives no indication of how much is likely to be lost if a loss is incurred.

- (d) Critique the use of this model to estimate tail risk.



## 6. Continued

### **Commentary on Question:**

*Candidate performance on this part was mediocre, with most addressing one or two points, and many discussing the shortcomings of using historical returns to predict future returns. Many candidates also mentioned the additional demands of time, effort, and cost required for a Monte Carlo model. Some candidates gave advantages of using a Monte Carlo model to assess tail risk, and did not pick up on the key point that using historical returns in its development could make it much less useful. In addition to those below, other valid critiques of using historical returns to calibrate a model to assess tail risk were also accepted.*

The use of historical returns in this model is inappropriate because it would ignore the potential of future black swans or extreme events, and past returns are not necessarily a good predictor of future returns. Also, the time period of historical returns chosen for model calibration is arbitrary but has a large impact on results.

## 7. Learning Objectives:

1. The candidate will understand measures of corporate value and be able to analyze the data in corporate financial statements.

### Learning Outcomes:

- (1a) Explain basic accounting concepts used in producing financial statements:
  - In insurance companies
  - In other financial institutions
  - In non-financial institutions
- (1b) Analyze a specific company financial situation by demonstrating advanced knowledge of balance sheet and income statement structures.

### Sources:

Fridson, Alvarez, Financial Statement Analysis: A Practitioners Guide, Fourth Edition, 2011

- Chapter 2, The Balance Sheet
- Chapter 3, The Income Statement
- Chapter 4, The Statement of Cash Flows
- Chapter 13, Credit Analysis

### Commentary on Question:

*This question tested candidates' understanding of financial statements and how they can be analyzed. As in several other questions, candidates breezed through lower cognitive level questions but struggled to find appropriate answers for higher level questions. Parts (a) and (b) were Comprehension questions, part (c) a Retrieval question, and part (d) Knowledge Utilization.*

### Solution:

- (a) In the context of analyzing and comparing corporations, describe the components, uses, and limitations of each of the types of financial statements by completing the table below:

	Balance Sheet	Income Statement	Statement of Cash Flows
Components			
Uses			
Limitations			

## 7. Continued

### Commentary on Question:

*Candidates generally had a stronger understanding of the balance sheet and income statement than the cash flow statement. Other answers than those shown below were accepted for certain parts.*

	Balance Sheet	Income Statement	Statement of Cash Flows
Components	<ul style="list-style-type: none"> <li>• Assets</li> <li>• Liabilities</li> <li>• Equity</li> </ul>	<ul style="list-style-type: none"> <li>• Revenue</li> <li>• Expense</li> <li>• Profit</li> </ul>	<ul style="list-style-type: none"> <li>• CF from Operations</li> <li>• CF from Investments</li> <li>• CF from Financing</li> </ul>
Uses	<ul style="list-style-type: none"> <li>• Provides a snapshot of the capital structure of the firm</li> </ul>	<ul style="list-style-type: none"> <li>• Provides insight into the operating performance and allows comparison to prior periods and other companies</li> <li>• Provides indication of the company cost structure</li> </ul>	<ul style="list-style-type: none"> <li>• Provides an indicator of operating and financial flexibility</li> <li>• Identifies where a company is in its life cycle</li> </ul>
Limitations	<ul style="list-style-type: none"> <li>• Not all components can be assigned a value</li> <li>• Some components are held at book value, which may differ from their market value</li> </ul>	<ul style="list-style-type: none"> <li>• Companies can use accounting to distort earnings, especially the manipulation of large loss events</li> </ul>	<ul style="list-style-type: none"> <li>• The statement cannot be used by itself; it must be used in conjunction with the B/S and I/S.</li> </ul>

- (b) Describe two techniques for defining a peer group for the purposes of comparative ratio analysis.

## 7. Continued

### **Commentary on Question:**

*Successful candidates were able to describe the ranking of a company within an industry peer group and identify the rating peer group. Several candidates applied peer group definitions from other uses (e.g. mergers and acquisitions) and did not receive full credit.*

One technique is to compare the company against a narrowly defined industry peer group, allowing for "slotting" (or ranking) of a company within its industry.

Another technique is to rank the company within a rating peer group in a broad economic sector, allowing for a larger sample size and comparison based on credit rating.

- (c) Calculate the following financial statement ratios for Huge Life. Show your work.
- (i) Debt-to-equity ratio
  - (ii) Net profit margin
  - (iii) Return on equity

### **Commentary on Question:**

*Candidates had little difficulty with this question.*

$$\begin{aligned}\text{Debt-to-equity ratio} &= (\text{Short-term debt} + \text{Long-term debt}) / \text{Total Equity} \\ &= (700 + 5,000) / 28,000 \\ &= 20\% \\ \text{Net profit margin} &= \text{Net Income} / \text{Sales} \\ &= 4,200 / 16,500 \\ &= 25\% \\ \text{Return on equity} &= \text{Net Income} / \text{Total Shareholders' Equity} \\ &= 4,200 / 28,000 \\ &= 15\%\end{aligned}$$

- (d) Assess possible strategic opportunities for Huge Life relative to its peer group.

### **Commentary on Question:**

*Candidates generally did poorly on this part, as many candidates did not connect Huge Life's financial condition with an applicable strategic initiative. Many responses, such as share buybacks, did not receive full credit as they were not strategic nor applied in relation to its peers.*

## **7. Continued**

Huge Life, with its low debt-to-equity ratio, has lower leverage and lower credit risk than its peers. Huge Life will have access to low-cost financing. This allows Huge Life to take on riskier projects, such as making acquisitions or entering new markets or products.

Huge Life, with its high net profit margin and ROE, is more efficient and profitable than its peers. This gives Huge Life the financial flexibility to lower prices to increase market share or increase commissions.