

# 2004 年 FRM 考題回顧

## Session I

(此處之題號僅為序號，並非 FRM 考試之原題號)

1. Two independent variables X and Y,  $E(X) = 4$ ,  $E(Y) = 3$ ,  $E(XY) = 11$ ,  $\text{Cov}(X, Y) = ?$
- A) -1
  - B) 0
  - C) 11
  - D) 12

※此題的題目可能出錯，因為獨立的隨機變數間相關係數應為 0。

2. Two traders: Brown and Parker: Brown earned a profit of 5 million with a volatility of 14%, while Parker's profit is 6 million with a volatility of 16%. Whose performance is better in RAROC with 99% confidence level?
- A) Brown
  - B) Parker
  - C) The same.

3. A 公司第一年的 probability of default = 0.03%，第二年為 0.04%，第三年為 0.06%，求前三年之 CMR。
- A) 12.47%
  - B) 12.78%
  - C) 13%

※此題的題目可能出錯，因為我算的答案應是 0.13%，懷疑是題目誤植

4. COSO 不包含下列何者？
- A) Company-level control
  - B) Risk assessment
  - C) Information and communication
  - D) Control activities

5. 下列 GARCH(1,1)模型，何者的 mean reverting 速度較快？

- A)  $\sigma_t^2 = 0.2 + 0.4r_{t-1}^2 + 0.98\sigma_{t-1}^2$
- B)  $\sigma_t^2 = 0.3 + 0.3r_{t-1}^2 + 0.96\sigma_{t-1}^2$
- C)  $\sigma_t^2 = 0.4 + 0.5r_{t-1}^2 + 0.98\sigma_{t-1}^2$
- D)  $\sigma_t^2 = 0.5 + 0.1r_{t-1}^2 + 0.96\sigma_{t-1}^2$

※此題答案的數字我並沒有記的十分清楚。

6. GARCH(1,1) model :  $\sigma_t^2 = \gamma V + \alpha r_{t-1}^2 + \beta \sigma_{t-1}^2$  , 其中  $\alpha = 0.013$  、 $\beta = 0.75$  、 $V = 0.00005$  、 $\sigma_{t-1}^2 = 0.00006$  。求 annualized volatility 。

※本題的數字我記的並不清楚，但回答時記得要 annualize——乘以 sqrt(252) 。

7. 已知：A 公司 asset 和 liabilities 之現值與 modified duration，若預期利率上漲或下跌 25 b.p.，應如何利用期貨來避險(給定期貨的現值與 modified duration)？

8. If risk-free rate increases, the impact on the value of an American put is:

- A) No impact.
- B) Negative.
- C) Positive.
- D) Cannot determine.

9. A 公司 probability of default = 0.2 ; B 公司為 0.4 ; 兩家公司同時 default 的機率 = 0.15 ; 求 A 、B 之 default correlation 。

10. 關於 Sarbanes-Oxley Act 下列敘述，哪些為真？

- I. CEO 與 CFO 須負大部份責任
- II. Audit committee 須管理外部 auditor 之薪酬與報告
- III. 內部 auditor 仍須管理外部 auditor 之 work scope...

11. FAS 133 之 hedge effectiveness test，若有 large mismatch，須用何種方法？

- A) Dollar-offset with...
- B) Dollar-offset with...
- C) Statistical analysis
- D) 前三者都可使用

※有關 FAS 133 的考題，此題是題組的第二題，該題組共有兩題。

12. 要用 normal distribution 來近似 Poisson distribution，必須試驗次數( $n$ )與成功機率( $p$ )：

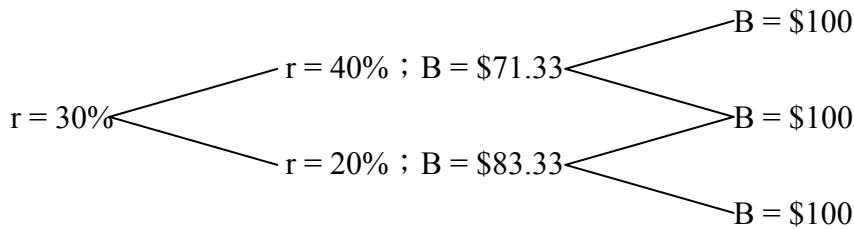
- A) 期望值很大
- B) 變異數很大
- C) 試驗次數很大，成功機率趨近於 1
- D) 試驗次數很大，成功機率趨近於 0

13. 下列何者上升不一定會使標的物為 dividend-paying stock 之 American call option 價值上升？

- A) S
- B)  $r_f$ .
- C) T
- D) Volatility

14. 在 operational risk 中，Scenario Analysis 的用途為何？

15. 兩年後到期的債券價格之二元樹如下：



以該債券為標的物之 put 在一年後到期，價格上漲的機率=0.5，履約價=75，求 put value  
 Ans. \$3.47

16. 一個三年的 option，其到期時的 payoff =  $\begin{cases} (S - X)^2, & \text{若每年 } S \text{ 上漲 } 15\% \\ 0 & , \text{ otherwise} \end{cases}$

目前  $S = 10$ 、volatility = 15%、 $r_f = 5\%$ ，求 option value：

- A) \$7
- B) \$8
- C) \$9
- D) \$10

17. 給定一年 T-bill 與 corporate bond 之殖利率，求 probability of default。

18.  $S = 280$ ， $X = 260$  之 call value = 16、put value = 3，怎樣的策略可以 lock a profit？  
 Ans.  $-S + \text{call}$

19. 10-year T-bond \$10 million，若  $\sigma_y = 0.074\%$ ，求算 99%、10 天的 VaR。  
 ※此題須自行假設 10-year T-bond 之 Duration = 7 來做計算)

20. According to Merton model, for firms with better ratings the probabilities of default will \_\_\_\_\_ and for firms with worse ratings their probabilities of default will \_\_\_\_\_ as time goes by.  
 A) Increase; decrease.  
 B) Increase; increase.  
 C) Decrease; decrease.  
 D) Decrease; increase.

21. In KMV model, if asset = 500, liability = 300, and the volatility of asset = 80, what is the distance to default?

22. Given a table showing the detailed data of Bank A's equity, such as shareholder value, retained earnings, goodwill, subordinate debt, ...*etc.*, calculate Tier 2 capital / Tier 1 capital ratio.
23. For Total Return Swaps, the buyer receives fixed 9%, floating rate is LIBOR + 50bp, the notional principal is 10 million. If the value of the reference bond appreciates 10%, what is the cashflow?
- A) Inflow ....  
 B) Outflow...  
 C) 0
24. 何者不是合理的避險原因？
- A) Tax.  
 B) ...  
 C) 為了幫 well-diversified investors 增加效用

## Session II

25. 關於 coherent risk measures 之特性，何者不對？(where  $a$  and  $b$  are constants.)
- A)  $\rho(x + y) \leq \rho(x) + \rho(y)$   
 B)  $\rho(ax) = a\rho(x)$   
 C)  $\rho(x) \geq \rho(y)$  if  $x \geq y$   
 D)  $\rho(x + b) = \rho(x) + b$
26. 有關 volatility smile 何者不對？
- A) One of the reasons is the fear of market crash.  
 B) For equity options, implied volatility increases as exercise price increases.  
 C) For foreign exchange options, at-the-money options have smaller implied volatility than in-the-money or out-of-the-money options.
27. Current exchange rate is 1.35 AUD/CAD. The interest rate for AUD is 2.4% and for CAD is 2%. If we want to use Black-Scholes formula to price a European option, how should we set the risk-free rate and dividend yield?
- A) Risk-free rate = 2.4%; dividend yield = 2%.  
 B) Risk-free rate = 2%; dividend yield = 2.4%.  
 C) Risk-free rate = 2.4%; dividend yield = 2.4%.  
 D) Risk-free rate = 2%; dividend yield = 2%.

28. Current exchange rate = 0.75 FRF/GBP. Given the 1-year interest rate in FRF and GBP. Calculate the exchange rate one year later if there is no arbitrage chance.
29. 承前題，如果目前的 forward exchange rate = 0.80，如何架構投資策略？
- A) Borrow FRF.
  - B) Borrow GBP.
  - C) Borrow FRF, buy GBP, and short a forward on FRF.
  - D) Borrow FRF, buy GBP, and short a forward on GBP.
30. FAS 133 中規定必須揭露的事項包括哪些？
- I. The risk unhedged.
  - II. ...
  - III. ...
  - IV. description of hedged item.
31. 在證券化過程中，investor analysis process 必須做的事情包括哪些？
- I. 創始機構的資產...
  - II. ....
32. CreditMetrics 不會用到哪個資訊？
- A) Correlation
  - B) Credit spread.
  - C) Migration matrix.
  - D) ....
33. 在 Basle II 的規定中，信用風險的 IRB 哪一項必定由銀行自行估算？
- A) PD
  - B) LGD
  - C) EAD
  - D) ...
34. CreditRisk+不會用到哪個資訊？
35. 哪一個不是 operational risk？
- A) ...
  - B) losses from catastrophe
  - C) ...

36. A 公司 defaults, B 公司與 A 公司有下列交易, 問 B 公司之 exposures。

I.  $A \rightarrow B$ , \$10 million

II.  $B \rightarrow A$ , \$ 6 million

III.  $A \rightarrow B$ , \$ 800,000;  $B \rightarrow A$ , \$ 1 million

IV. 業務往來... (前三者都是衍生性商品的交易, 但第四項不是)

B) 10.8 million

C) 4 million

D) 3.8 million

E) 0.8 million.

37. 何者不是證券化中的 credit enhancement?

A) ...

B) Over-collateralization.

C) ...

D) Enhancing spread.

38. What is the probability of default for a company rating B after 2 years?

|   | A    | B    | C   | D    |
|---|------|------|-----|------|
| A | 0.9  |      |     | 0    |
| B | 0.12 | 0.86 | 0.2 | 0    |
| C |      |      |     | 0.02 |
| D | 0    | 0    | 0   | 1    |

39. 距到期三個月的 European put,  $X = 30$ ,  $S = 30$ , delta = ?

A) -1.

B) 0.5.

C) -0.5.

D) 1.

40. CDO 分三個 tranches, Tranche 1 佔 10%, 會承受最前 10% 的損失; Tranche 2 佔 20%, 會承受接下來 20% 的損失; Tranche 3 佔其餘的 70%。問下列何者正確?

※答案選項大約是: Tranche 1 的 spread 最低? Tranche 3 通常被 S&P 評為 AAA? ...

41. 一公司第一年的 Probability of default = 0.4%, 兩年的 the average (annualized) default probability = 0.6%, 問第二年的 MMR:

A) 0.73%

B) 0.3%

C) 0.9%

42. 基金經理人要去渡假，將手中一 nondividend-paying call 委託給同事，問何時應 early exercise ?

43. 下列哪些是 Metallgesellschaft Refining and Marketing (MGRM) 失敗的原因？

I. Mismatch....

II. ....

44. Barings 失敗的原因是沒有做好哪種風險的管理？

A) Operational risk.

B) ...

45. Market model 迴歸模型之估計結果為：

|                              |      |
|------------------------------|------|
| $\beta$                      |      |
| $\alpha$                     |      |
| Coefficient of determination | 0.66 |
| Standard error               | 2.42 |

下列何者為真？

I. 34% unexplained.

II. Correlation coefficient = 0.71

III. Portfolio return is dependent variable.

IV. When portfolio return is 12%, the confidence interval is [7.16%, 16.84%].