

【財管所甲丙組】

第一部分：投資學（共五十分。配分如各題標示）

壹、單選題（每小題三分、共三十分）

1. Suppose the risk-free return 4% and the market portfolio has an expected return of 10% and a volatility of 16%. Johnson and Johnson Corporate [Ticker: JNJ] stock has a 20% volatility and a correlation with the market of 0.06. What is Johnson and Johnson's beta with respect to the market, and what is its expected return under CAPM assumptions?

- (A) Beta = -0.032, $E[r] = 11.324\%$
 (B) Beta = 0.075, $E[r] = 12.653\%$
 (C) Beta = 0.095, $E[r] = 13.432\%$
 (D) Beta = 1.212, $E[r] = 14.988\%$
 (E) Beta = 1.347, $E[r] = 16.003\%$

2. Below are the beta estimates under the Fama-French 3 factor model:

	β^{Mkt}	β^{SMB}	β^{HML}
Firm A	1.20	0.80	0.78
Firm B	1.81	0.21	1.25

Which of the following statements are most likely to be true?

- (A) Firm A has a larger market capitalization than Firm B.
 (B) Firm A has higher standard deviation in its returns than Firm B.
 (C) Firm A is closer to financial distress than Firm B.
 (D) Firm A has lower systematic risk than Firm B.
 (E) Firm A is more susceptible to market-wide shocks that affect small firms.
3. Which of the following statements is false?
- (A) The amount of each coupon payment is determined by the coupon rate of the bond.

- (B) Prior to its maturity date, the price of a zero-coupon bond is always greater than its face value.
- (C) The simplest type of bond is a zero-coupon bond.
- (D) Treasury bills are U.S. government bonds with a maturity up to one year.
- (E) Yields-to-maturity is an approximate rate of return if you buy the bond and hold it to maturity.

- 4.** Mack Industries just paid a dividend of \$1.00 per share (i.e., $D_0 = \$1.00$). Analysts expect the company's dividend to grow 20 percent this year (i.e., $D_1 = \$1.20$), and 15 percent next year. After two years the dividend is expected to grow at a constant rate of 5 percent. The required rate of return on the company's stock is 12 percent. What should be the current price of the company's stock?
- (A) \$12.33 (B) \$16.65 (C) \$16.91 (D) \$18.67
(E) \$19.67

- 5.** You have noticed a phenomenon that stock prices tend to rise more in the subsequent trading days following good earnings announcements. This would be evidence of:
- (A) efficient markets in the strong form
(B) inefficient markets in the strong form
(C) efficient markets in the semi-strong form
(D) inefficient markets in the semi-strong form
(E) efficient markets in the weak form

- 6.** A portfolio consists of 800 shares of stock and 100 calls on that stock. If the hedge ratio for the call is 0.5. What would be the dollar change in the value of the portfolio in response to a one dollar decline in the stock price?
- (A) +\$700 (B) -\$850 (C) -\$580 (D) -\$520
(E) None of the above.

- 7.** Consider the free cash flow approach to stock valuation. Utica Manufacturing Company is expected to have before-tax cash flow from operations of \$500,000 in the coming year. The firm's corporate tax rate is 30%. It is expected that \$200,000 of operating cash flow will be invested in new fixed assets. Depreciation for the year will be \$100,000. After the coming year, cash flows are

貳、填充題 (共二十分)

1. In facing increasing volatility in the stock market, you are advising your clients to spread their risk across an equity mutual fund (with an expected return of 10% and a standard deviation of 12%) and a bond fund (with an expected return of 6% and a standard deviation of 5%). In other words to form a portfolio using the equity fund and the bond fund. Suppose the correlation between the equity fund and bond fund is 0.1.

(A) Mr. Sam wants to control his exposure of volatility (i.e. standard deviation) to 5.9093%. Mr. Sam should divide his assets into _____% in the equity mutual fund and _____% in the bond fund. (四分)

(B) Mrs. Sam wants to earn an expected return of 8% from her portfolio. Mrs. Sam should divide her assets into _____% in the equity mutual fund and _____% in the bond fund. (四分)

(C) Which client is more risk averse: _____. (二分)

2. Consider a one-year maturity call option and a one-year put option on the same stock, both with striking price \$100. If the risk-free rate is 5%, the stock price is \$103, and the put sells for \$7.50. The price of the call option should be _____. (五分)

3. You are an options dealer. One of your clients wants to purchase a one-year European call option on HAL with a strike price of \$20. Another dealer is willing to write a one-year European put option on HAL with a strike price of \$20 with a cost of \$3.5. Assume HAL pays no dividends and trading for \$18 per share, and the risk-free rate is 6%. The lowest price you can charge for the option is _____. (五分)

第二部分：財務管理 (共五十分。每題 5 分)

壹、填充題

1. Joy Corporation is considering a 3-year project with an initial cost of \$633,000. The project will not directly produce any sales but will reduce operating costs by \$265,000 a year. The equipment is depreciated straight-line to a zero book value over the life of the project. At the end of the project the equipment will be sold for an estimated \$55,000. The tax rate is 34%. The project will require \$24,000

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in extra inventory for spare parts and accessories. What is NPV of this project if Joy Corporation requires a 9% rate of return? Should Joy Corporation accept this project? _____, _____ (兩小題皆需正確才給分)

- 2.** You are analyzing two mutually exclusive projects and have developed the following information. What is the incremental IRR? If the required rate of return is 15%, should you accept Project X _____, _____ (兩小題皆需正確才給分)

Year	Project X	Project Y
0	– \$65,400	– \$75,500
1	\$30,155	\$35,000
2	\$25,000	\$30,000
3	\$18,000	\$21,555

- 3.** After graduation, you plan to work for Mary Corporation for 12 years and then start your own business. You expect to save and deposit \$8,800 a year for the first 6 years ($t = 1$ through $t = 6$) and \$13,000 annually for the following 6 years ($t = 7$ through $t = 12$). The first deposit will be made a year from today. In addition, your grandfather just gave you a \$16,000 graduation gift which you will deposit immediately. If the account earns 8.5% compounded annually, how much will you have when you start your business 12 years from now?

- 4.** Last year NTU Industries had sales of \$456,000, assets of \$175,000, a profit margin of 5.15%, and an equity multiplier of 1.2. The CFO believes that the company could reduce its assets by \$66,000 without affecting either sales or costs. Had it reduced its assets by this amount, and had the debt/assets ratio, sales, and costs remained constant, how much would the ROE have changed?

- 5.** Paul has a \$40 million portfolio that is equally as risky as the market. The risk-free rate is 4.11%, and the market risk premium is 7.90%. Paul expects to receive an additional \$60 million which he plans to invest in additional stocks. After investing the additional funds, he wants the fund's required and expected return

to be 15.00%. What must the average beta of the new stocks be to achieve the target required rate of return? _____

- 6.** Katlin Inc. forecasts that it will have the free cash flows (in millions) shown below. If the weighted average cost of capital is 14% and the free cash flows are expected to continue growing at the same rate after Year 3 as from Year 2 to Year 3, what is the firm's total corporate value, in millions? _____

Year	1	2	3
Free Cash Flow	-\$355	\$554	\$611

- 7.** Jack Co. has a 6-year, 6.5% semi-annual coupon bond with a \$1,000 par value. Tracy Co. has a 12-year, 9% semi-annual coupon bond with a \$1,000 par value. Both bonds currently have a yield to maturity of 7%. If the market yield increases to 8%, the value of Jack Co.'s coupon bond should _____ by _____%. Similarly, the value of Tracy Co.'s bond should _____ by _____%. (答案格式如 increase [or decrease] by

x%)

- 8.** Your parents helped you start saving \$30 a month beginning on your 10th birthday. They always made you make your deposit on the first day of each month just to "start the month out right." Today, you turn 21 and have \$5,566.66 in your account. What is your rate of return on your savings? _____

- 9.** David Inc. is planning to issue two types of 25-year, noncallable coupon bonds to raise a total of \$6 million, \$3 million from each type of bond. First, 3,000 bonds with a 10% semi-annual coupon will be sold at their \$1,000 par value to raise \$3,000,000. Second, discount bonds, also with a 25-year maturity and a \$1,000 par value, will be sold, but these bonds will have a semi-annual coupon of only 7.25%. The discount bonds must be offered at below par in order to provide investors with the same effective yield as the par bonds. How many discount bonds must the firm issue to raise \$3,000,000? Assume no flotation costs, and round your final answer up to a whole number of bonds. _____

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10. Sara Co. just announced that it will pay a dividend next year of \$2.70 and is establishing a policy whereby the dividend will increase by 1.75% annually thereafter. How much will one share be worth four years from now if the required rate of return is 15%? _____

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第一部分：投資學（共五十分。配分如各題標示）

壹、單選題（每小題三分、共三十分）

1. (B)

$$R_f = 0.04$$

$$R_m = 0.1, \sigma_m = 0.16, \sigma_i = 0.2, \rho_{im} = 0.06$$

$$\beta_i = \frac{\sigma_{im}}{\sigma_m^2} = \frac{0.06 \times 0.2}{0.16} = 0.075$$

$$R_i = 0.04 + (0.1 - 0.04) \times 0.075 = 4.45\%$$

2. (E)

說明：(A) A 的市值比 B 大 \Rightarrow 錯

A 的 β^{SMB} 比較大，故相對而言是規模比較小的企業

(B) 不一定；因 Beta 值只能看出系統性 Risk，其與總 Risk(σ) 間沒有必然關係

(C) 不一定；BM ratio 愈大代表公司發生財務危機的可能愈高，而 A 公司的 β^{HML} 較小，故比較無財務危機

(D) 不一定

(E) A 更容易受到影響小企業的廣泛炒作 \Rightarrow 對
因為 A 的 β^{SMB} 大

3. (B)

4. (D)

$$D_0 = 1, g_1 = 0.2, g_2 = 0.15, g_{3...} = 0.05, k_s = 0.12$$

0	1	2	

↓	1 × 1.2 = 1.2	1.2 × 1.5 = 1.38	$P_2 = \frac{1.38 \times 1.05}{0.12 - 0.05} = 20.7$
$P_0 = \frac{1.2}{1.12} + \frac{1.38 \times 20.7}{1.12^2} = 18.67$			

5. (D)

6. (B)

$$h = \frac{\Delta C \downarrow 0.5 \times 100}{\Delta S \downarrow 1 \times 800} = 0.5$$

↓ 50

↓ 800

↓ 850

7. (B)

$$\begin{aligned} OCF &= NII + D \\ &= (500,000 - 100,000) \times (1 - 30\%) + 100,000 \\ &= 380,000 \end{aligned}$$

$$\begin{aligned} \text{Free Cash Flow} &= 380,000 - 200,000 \\ &= 180,000 \end{aligned}$$

8. (B)

9. (D)

10. (A)

貳、填充題 (共二十分)

1. (A) _____ ; _____

$$\begin{aligned} \sigma_P^2 &= W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2W_A W_B \sigma_{AB} \\ 0.059093^2 &= W^2 \times 0.12^2 + (1 - W)^2 \times 0.05^2 + 2 \times w \times (1 - w) \times 0.1 \times 0.12 \times 0.05 \end{aligned}$$

(B) _____ 50% _____ ; _____ 50% _____

$$0.08 = w \times 0.1 + (1 - w) \times 0.06$$

$$w = 50\%$$

超越巔峰

十七名校財務管理

(C) MR. Sam

Mr. Sam $\sigma_p = 0.059093$

Mr. Sam $\sigma_p^2 = 0.5^2 \times 0.12^2 + 0.5^2 \times 0.05^2 + 2 \times 0.5 \times 0.5 \times 0.1 \times 0.12 \times 0.05$
 $= 0.004525$
 $\sigma_p = 0.0673$

2. 17.38

$k=100, R_f=0.05, s_0=105, p=7.5, T=1$ 年

$105 + 7.5 - C = 100 \times e^{-0.05 \times 1}$

$C = 17.38$

3. 2.6647

$T=1$ 年, $k=20, p=3.5, s_0=18, r_f=0.06$

$18 + 3.5 - C = 20 \times e^{-0.06 \times 1}$

$C = 2.6647$

第二部分：財務管理（共五十分。每題 5 分）

壹、填空题

1.

0	1	2	3
-609,000	243,920	243,920	243,920
-24,000			55,000
-633,000			-55,000 × 0.34
			+24,000
			+304,220

$D = \frac{609,000}{3} = 203,000$

$OCF = 265,000 \times (1 - 34\%) + 203,000 \times 0.34 = 243,920$

$NPV = -633,000 + \frac{243,920}{1.09} + \frac{243,920}{1.09^2} + \frac{304,220}{1.09^3} = 30,996$

Accept

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2.

x	y	Incremental Cash Flow
-65,400	-75,500	-10,100
30,155	35,000	4845
25,000	30,000	5000
18,000	21,555	3555

$$-10,100 + \frac{4845}{(1+r)^1} + \frac{5000}{(1+r)^2} + \frac{3555}{(1+r)^3} = 0$$

$$r = 16.44\%$$

Ans : (1) Incremental IRR = 16.44%

(2) 如果資金成本小於 IIRR，則應接受規模較大的投資計劃 y！

3.

245,839

$$16,000 \times 1.085^{12} + 8800 \times \frac{1.086^6 - 1}{0.085} \times 1.085^6 + 13,000 \times \frac{1.086^6 - 1}{0.085}$$

$$= 245,839$$

4.

原來 $ROE = 0.0515 \times \frac{456,000}{175,000} \times 1.2 = 0.161$

$$\text{Net Income} = 456,000 \times \frac{5.15}{100} = 23,484$$

$$\frac{TA}{E} = 1.2 = \frac{175,000 - 66,000}{\text{Equity}}$$

↓

$$\text{New ROE} = \frac{90,833}{23,484} = 0.259$$

Ans : 上升 9.8%

5.

1.6308

$$R_f = 0.0411$$

$$R_m - R_f = 0.079$$

$$R_i = 0.15$$

$$0.0411 + 0.079 \times \beta_p = 0.15$$

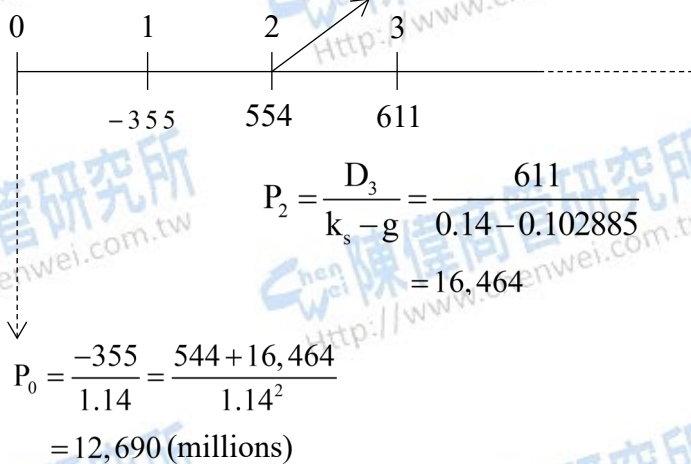
$$\beta_p = 1.378481$$

$$1 \times \frac{40}{100} + \beta \times \frac{60}{100} = 1.378481$$

$$\beta = 1.6308$$

6. $\frac{611}{554} - 1 = 0.102888$

$$g = 0.102885$$



7. Decrease, 4.74%; Decrease, 7.27%

Jack-

$$1000 \times 6.5\% \times \frac{1}{2} \times \frac{1 - 1.035^{-12}}{0.035} + \frac{1000}{(1.035)^{12}} = 975.84$$

$$1000 \times 6.5\% \times \frac{1}{2} \times \frac{1 - 1.04^{-12}}{0.04} + \frac{1000}{(1.04)^{12}} = 929.61$$

$$\frac{929.61}{975.84} - 1 = -4.74\%$$

Tracy-

$$1000 \times 9\% \times \frac{1}{2} \times \frac{1 - 1.035^{-24}}{0.035} + \frac{1000}{(1.035)^{24}} = 1160.583$$

$$1000 \times 9\% \times \frac{1}{2} \times \frac{1 - 1.04^{-24}}{0.04} + \frac{1000}{(1.04)^{24}} = 1076.235$$

$$\frac{1076.235}{1160.583} - 1 = -7.27\%$$

8. $(21 - 10) \times 12 = 132$

$$30 \times \frac{(1+r)^{132} - 1}{r} \times (1+r) = 5566.66$$

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$$r = \frac{(1+r)^{132} - 1}{r} \times (1+r)$$

$$r = 5.29\%$$

$$9. \quad 1000 \times 7.25\% \times \frac{1}{2} \times \frac{1 - 1.05^{-50}}{0.05} + \frac{1000}{1.05^{50}} = 748.9810$$

$$\frac{3000,000}{748,981} = 4005.5$$

Ans：要發行 4005.5 張折價公司債，才能滿湊足\$3000,000 的資金。

$$10. \quad P_4 = \frac{D_5}{k_s - g} = \frac{D_1 + (1+g)^4}{k_s - g} = \frac{2.7 \times 1.0 - 1.75^4}{0.15 - 0.0175} = 21.84$$